

STATE OF NEW HAMPSHIRE

Impairments Added to the 2018 303(d) List of Threatened or Impaired Waters

August 8, 2019



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2018 303(d) List of Threatened
or Impaired Waters**

**STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DRIVE
CONCORD, N.H. 03301**

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August 8, 2019

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Introduction

In accordance with Section 303(d) of the federal Clean Water Act, States must prepare a list of impaired waters that require a Total Maximum Daily Load study every two years (i.e., the 303(d) List). The last approved 303(d) List was prepared by the New Hampshire Department of Environmental Services (NHDES) in 2012. The State's final 2014 and 2016 Section 303(d) Lists of impaired waters were submitted to the US Environmental Protection Agency (USEPA) on March 27, 2017 and November 30, 2017, respectively. The USEPA issued partial approvals of the 2014 and 2016 Lists on March 16, 2018 and June 22, 2018, respectively. The 2014 partial approval covered all fresh waters and some estuarine waters, with the exception of Little Bay, the Bellamy River, the Cocheco River, the Upper Piscataqua River, Portsmouth Harbor, Little Harbor/Back Channel, Great Bay and Upper Portsmouth Harbor. The partial approval of the 2016 List had deferment of nearly the same list of waterbodies with one exception. The Cocheco River was included in the approved portion of the 2016 303(d) List. Due to the complexity of the assessment issues involved, the USEPA deferred action on the State's list with respect to the aforementioned waterbodies until a later date when its review has been completed. Downloadable copies of the past lists as well as the draft 303(d) 2018 list are available on the NHDES website for review (<http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>). This document provides a list of all surface waters and parameter combinations that were removed from categories 4A, 4B, or 4C impairments on the 2018 305(b) and the reasons why they were removed.

Assessment outcomes cover a spectrum from very good to very bad coded as an alpha numeric scale that provides additional distinctions in cases where an impairment exists. In each of the new impairments detailed within this document, the 2016 and 2018 assessment status is highlighted applying the categories in the table below.

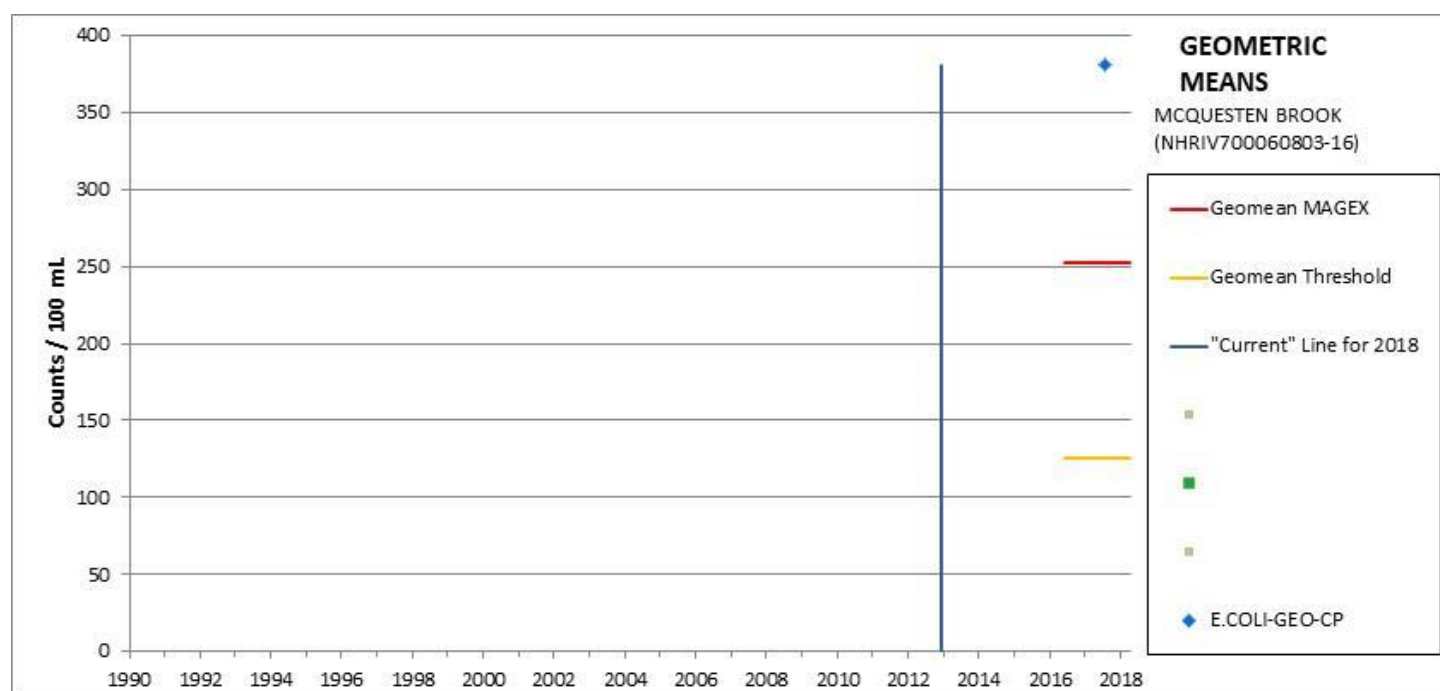
		Severe Not Supporting, Severe	Poor Not Supporting, Marginal	Likely Bad Insufficient Information – Potentially Not Supporting	No Data No Data	Likely Good Insufficient Information – Potentially Full Supporting	Marginal Full Support, Marginal	Good Full Support, Good
CATEGORY	Description							
Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL Needed	5-P	5-M or 5-T					

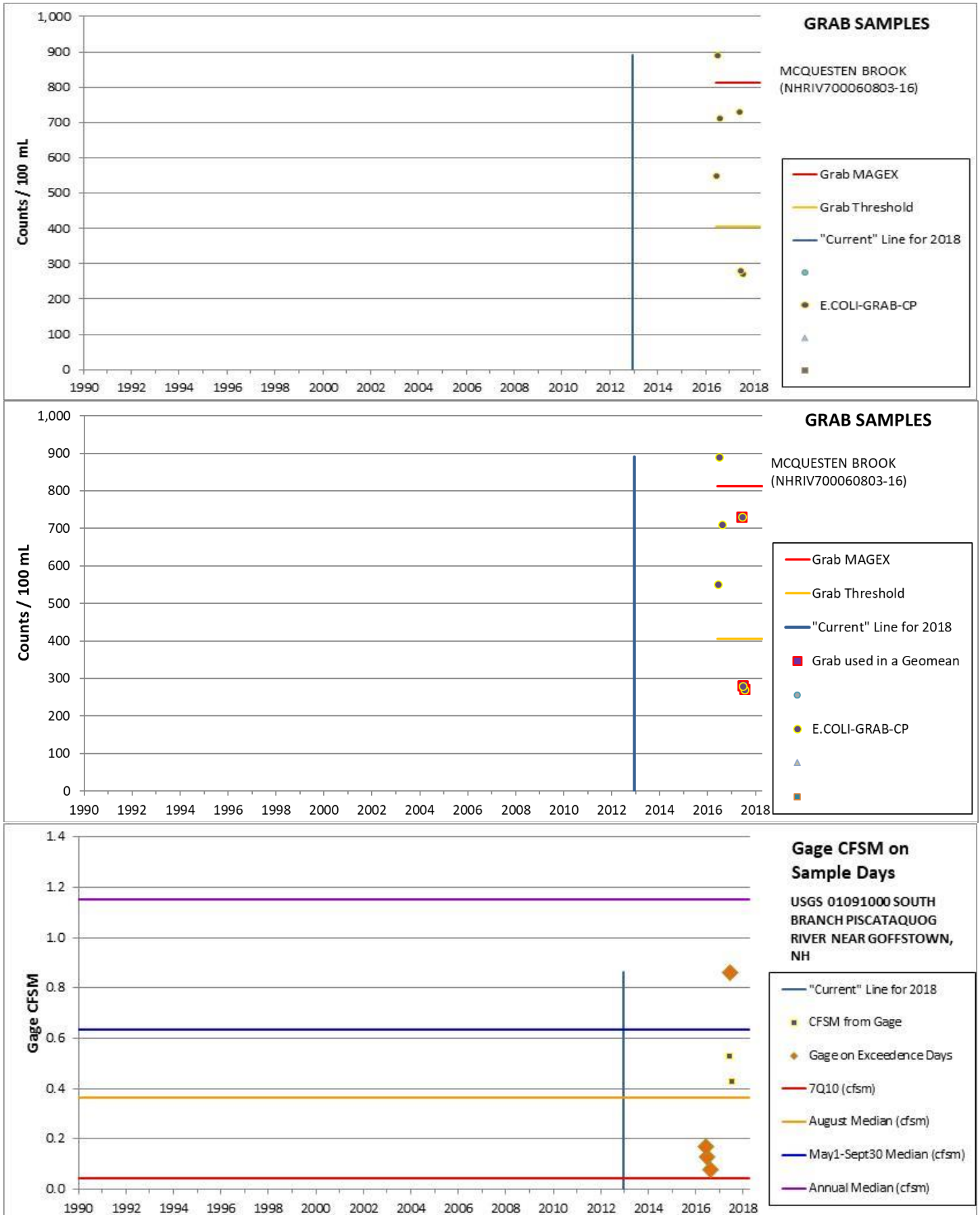
Bacteria for Primary Contact Recreation (i.e. swimming)

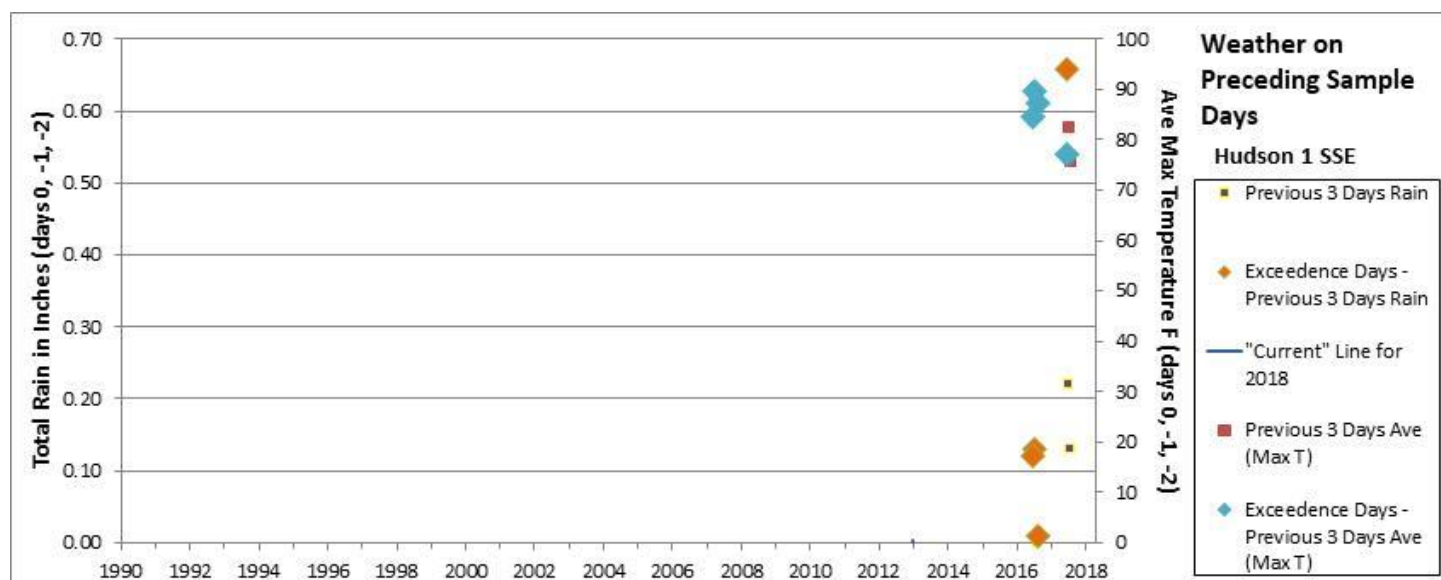
MCQUESTEN BROOK (NHRIV700060803-16)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
McQUESTEN BROOK	NHRIV700060803-16	Escherichia coli	BEDFORD, MANCHESTER	3-PNS	5-P

The only geomean included in the current assessment period (2013-2018) was above the geometric mean MAGEX threshold of 252 cts/100 mL with a geomean of 370 cts/100 mL. Four of the six grab samples were above the single sample water quality threshold of 406 cts/100 mL, with one greater than the MAGEX threshold of 812 cts/100 mL. The high *Escherichia coli* grab samples were taken at station 02-MQB at flows ranging from 0.08 to 0.86 cfs on the South Branch Piscataquog River gage (01091000) and 3-day precipitation totals from 0.00 to 0.66 inches. McQuesten Brook (NHRIV700060803-16) has been moved from 3-PNS to 5-P for *Escherichia coli* for the primary contact recreation designated use based on data collected in the current assessment period.







Notes:

E. COLI-GEO-CP = *Escherichia coli* geometric mean calculated from samples collected during the summer critical period.

E. COLI -GEO-NCP = *Escherichia coli* geometric mean calculated from samples collected outside the summer critical period.

E. COLI -GRAB-CP = *Escherichia coli* grab samples collected during the summer critical period.

E. COLI -GRAB-NCP = *Escherichia coli* grab samples collected outside the summer critical period.

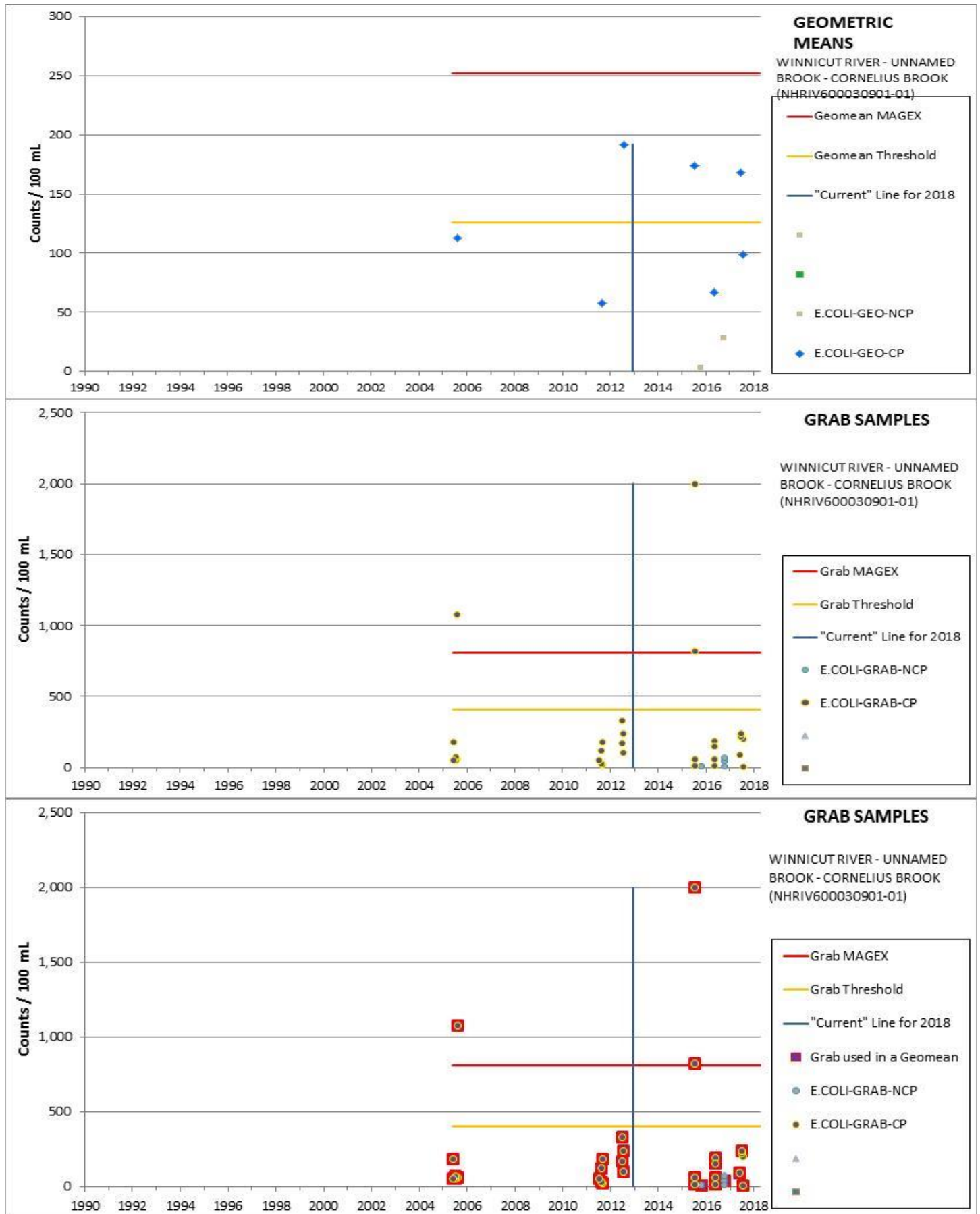
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

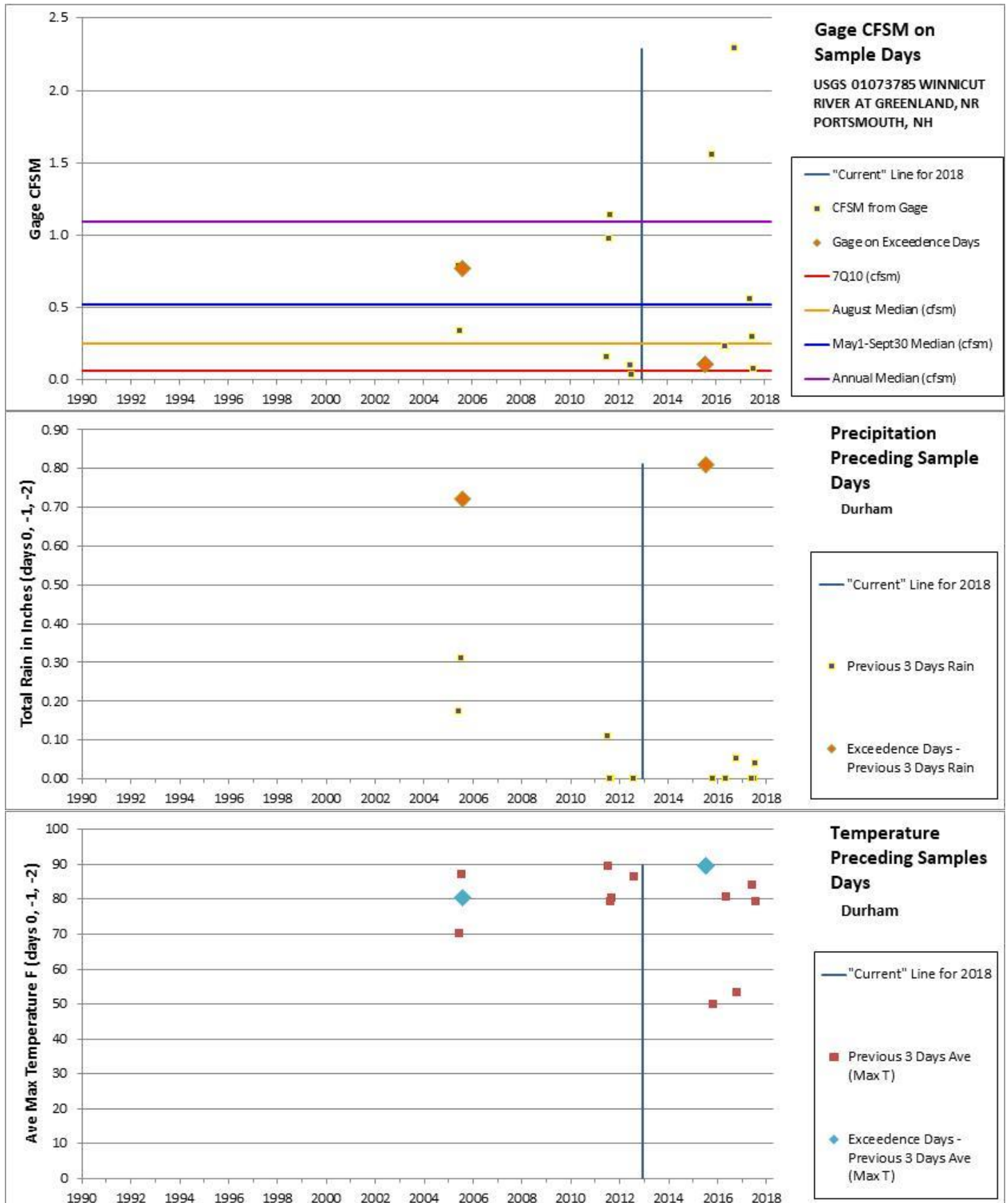
WINNICUT RIVER - UNNAMED BROOK - CORNELIUS BROOK (NHRIV600030901-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
WINNICUT RIVER - UNNAMED BROOK - CORNELIUS BROOK	NHRIV600030901-01	Escherichia coli	NORTH HAMPTON, HAMPTON, STRATHAM	3-PNS	5-P

Two of four GEOMEANS included in the 2018 assessment exceed the GEOMEAN criteria (126 cts/100mL). Two (2,000 cts/100mL, 8/5/2015; 820 cts/100mL, 8/5/2015) of 13 samples exceeded the single sample MAGEX criteria (812 cts/100mL). Estimated stream flow on 8/5/2015 was 0.10 cfs and 0.8" of rain fall has occurred in the past 3-days. Pre-2013 data included a GEOMEAN of 191.6 cts/100mL that exceeded GEOMEAN criteria. Since 2013, 22% (2 of 9) of the GEOMEANS from this assessment unit have exceeded the respective criteria. Sampling has been completed at a variety of stations including 02-COR, 16-WNC, CB-1, CB-2, CB-3, and PD-1. The high bacteria concentrations were observed at stations CB-2 and CB-3. Sampling has been completed mostly when area stream flow was <1.5 cfs and rainfall within the last 3-days was <1". Repeated exceedences of the GEOMEAN criteria and occasional MAGEX exceedences warrant the site being listed as category 5-P. The Winnicut River - Unnamed Brook - Cornelius Brook (NHRIV600030901-01) has been moved from 3-PNS to 5-P for *Escherichia coli* for the primary contact recreation (i.e. swimming) designated use based on data collected in the current assessment period.

Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters





E. COLI -GEO-NCP = *Escherchia coli* geometric mean calculated from samples collected outside the summer critical period.

E. COLI -GRAB-CP = *Escherchia coli* grab samples collected during the summer critical period.

E. COLI -GRAB-NCP = *Escherchia coli* grab samples collected outside the summer critical period.

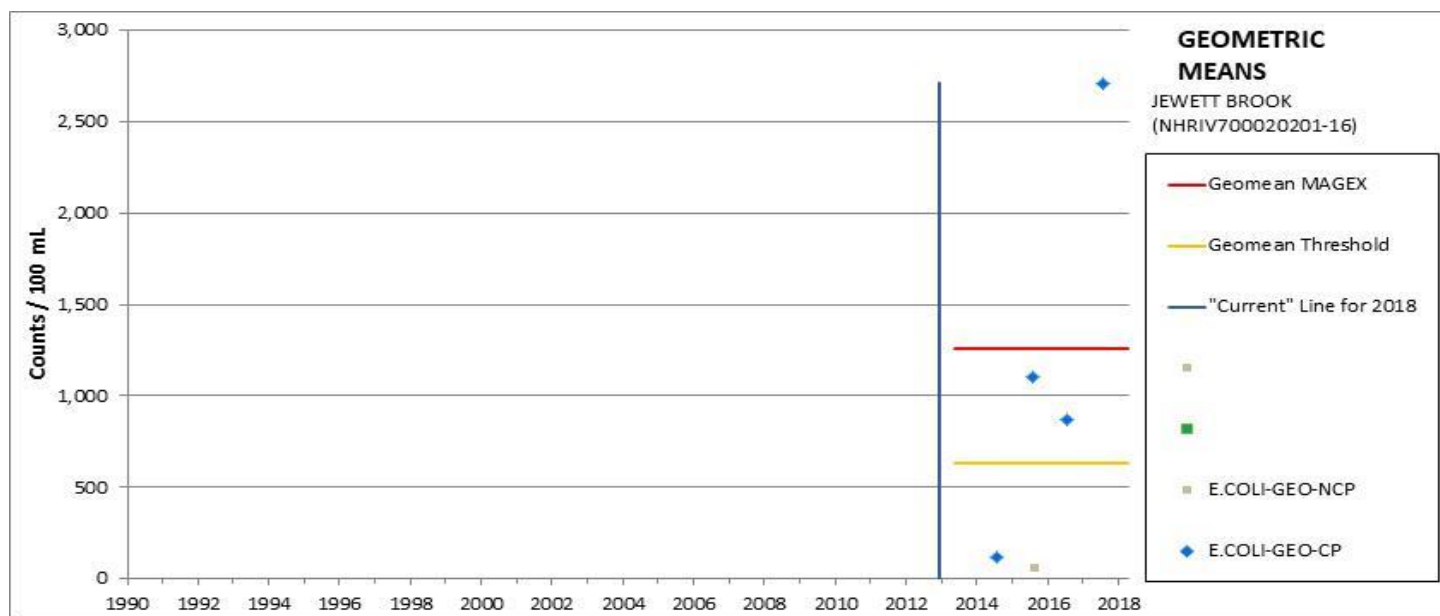
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

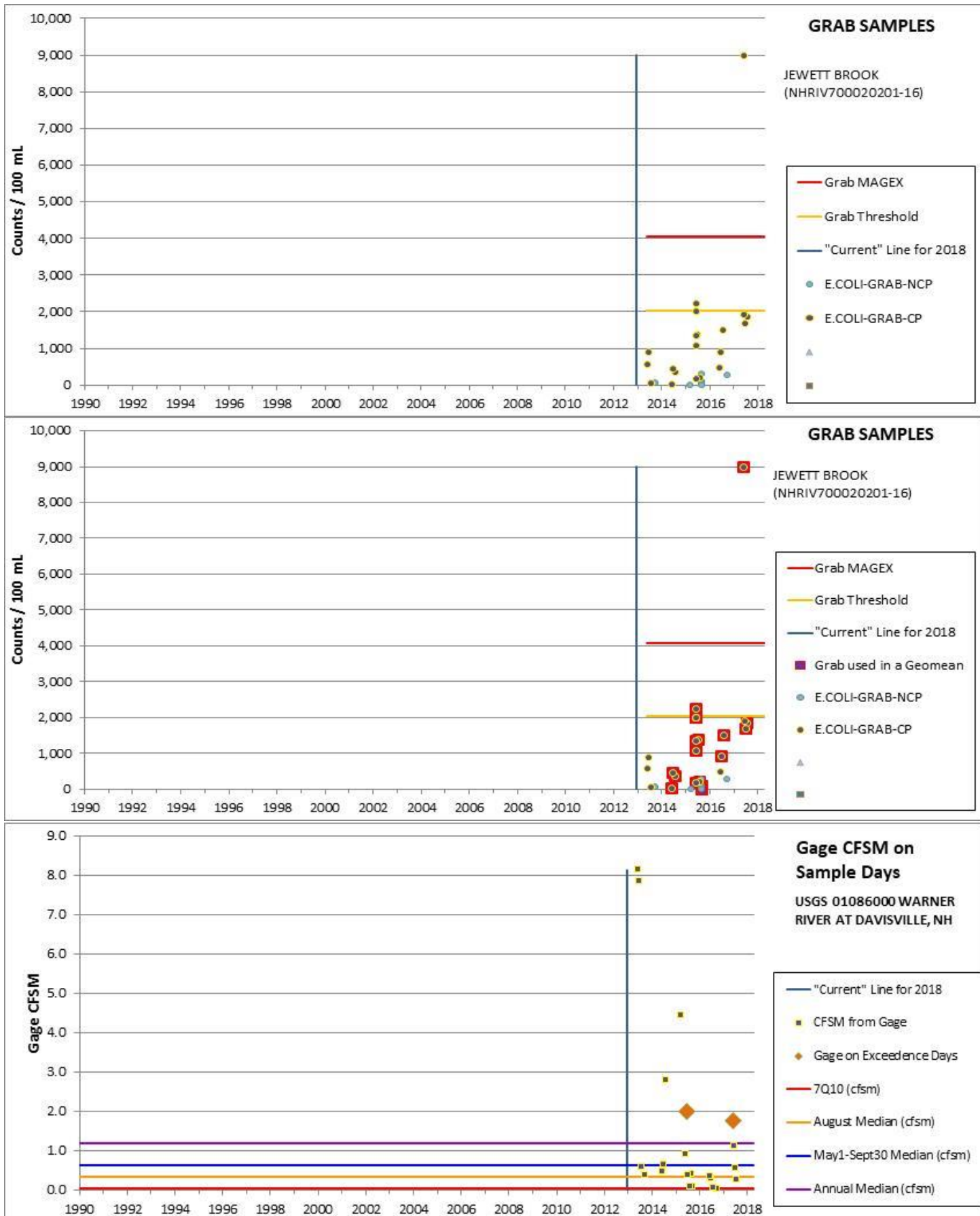
Bacteria for Secondary Contact Recreation (i.e. boating)

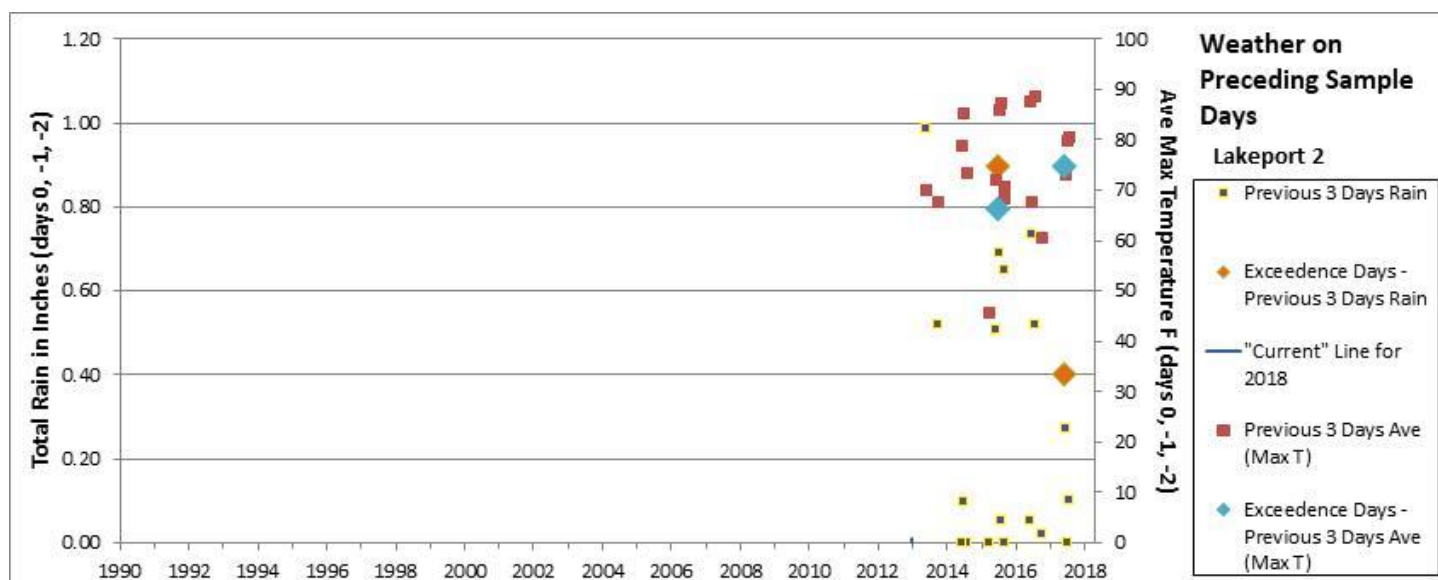
JEWETT BROOK (NHRIV700020201-16)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
JEWETT BROOK	NHRIV700020201-16	Escherichia coli	GILFORD, LACONIA	3-PNS	5-P

Five GEOMEANS are included in the 2018 assessment cycle and three (60%) exceed the GEOMEAN threshold (630 cts/ 100mL) and one (20%) exceed the MAGEX GEOMEAN threshold (1,260 cts/ 100mL) for secondary contact recreation. Thirty-four single samples are included in the 2018 assessment cycle and two (6%) exceeded the single sample threshold (2,030 cts/ 100mL). Samples were collected under a variety of conditions with estimated stream flows ranging from 0.06 to 8.0 cfs and the previous 3-days of rainfall ranging from 0.01 to 1". Threshold exceedences have occurred under a variety of stream flow and rainfall conditions. Sampling occurs three times annually at 01-JWT as part of the NHDES river trend monitoring program. Samples exceeding the single sample threshold have been collection from 01-JWT, 02-JWT, 05-JWT, 07-JWT, 13-JWT, and 18-JWT. Jewett Brook (NHRIV700020201-16) has been moved from 3-PNS to 5-P for *Escherichia coli* for the secondary contact recreation designated use based on data collected in the current assessment period.







Notes:

E. COLI-GEO-CP = *Escherchia coli* geometric mean calculated from samples collected during the summer critical period.

E. COLI -GEO-NCP = *Escherchia coli* geometric mean calculated from samples collected outside the summer critical period.

E. COLI -GRAB-CP = *Escherchia coli* grab samples collected during the summer critical period.

E. COLI -GRAB-NCP = *Escherchia coli* grab samples collected outside the summer critical period.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

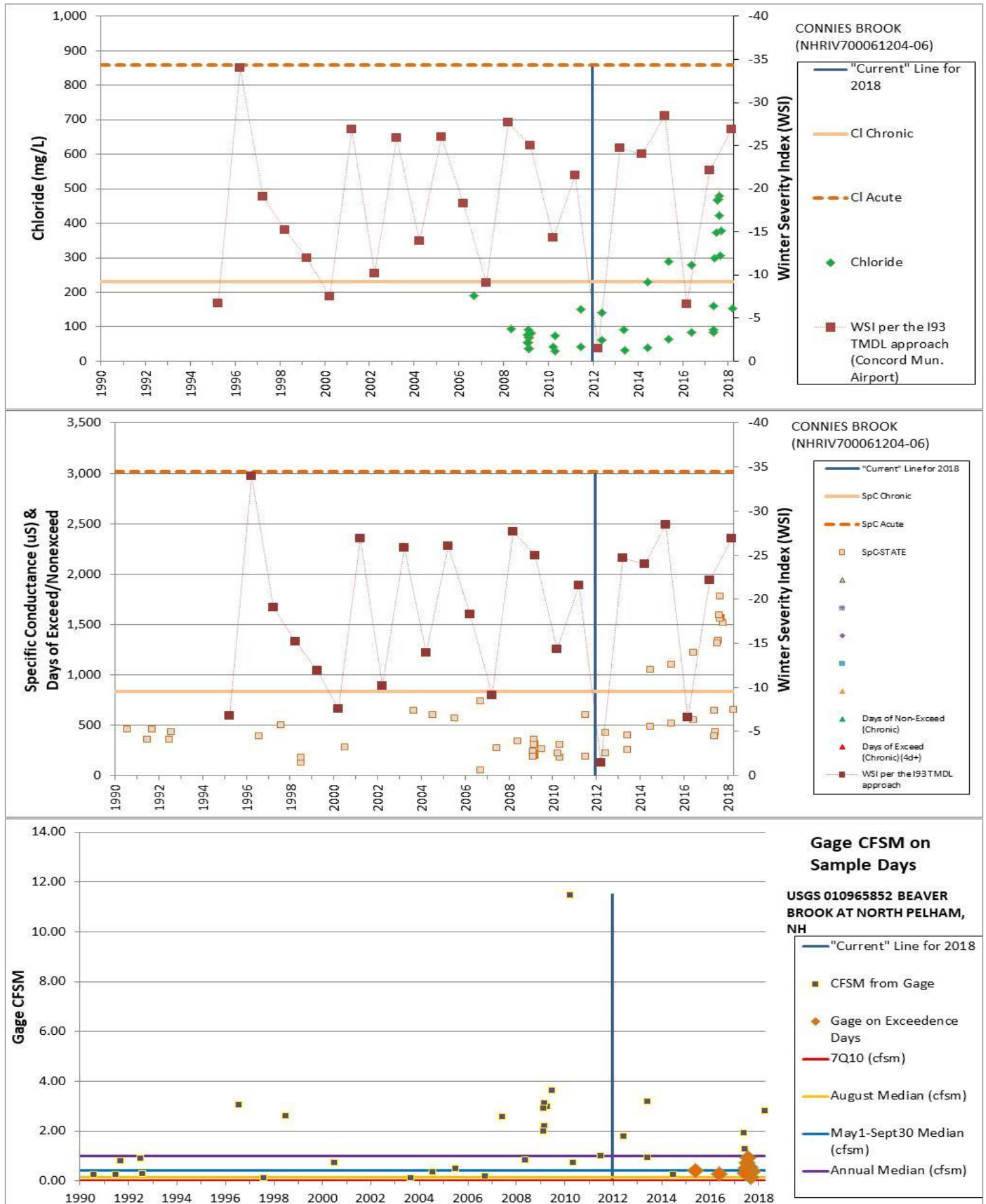
Chloride for Aquatic Life Integrity

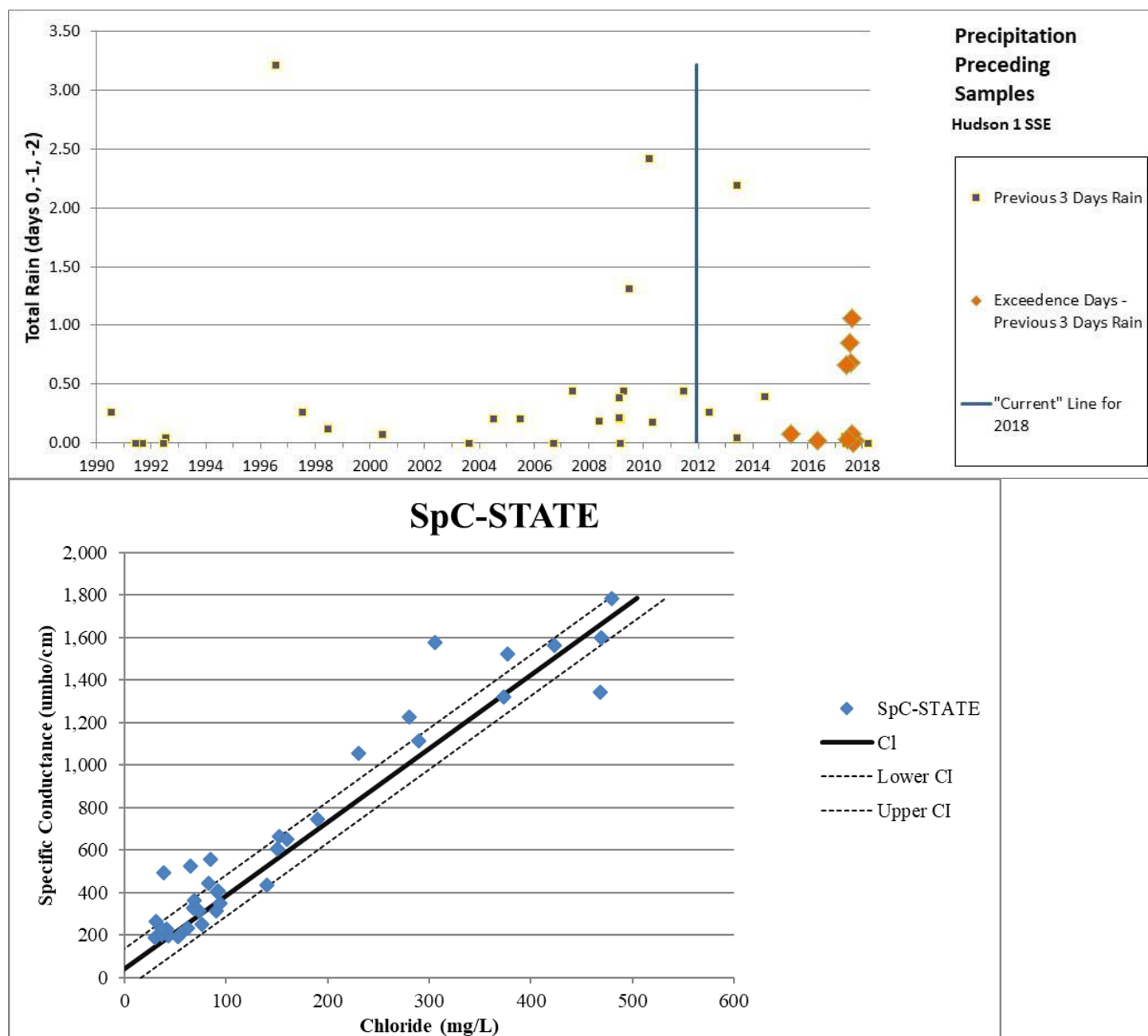
CONNIES BROOK (NHRIV700061204-06)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
CONNIES BROOK	NHRIV700061204-06	Chloride	WINDHAM	3-PNS	5-M

Chloride and specific conductance measurements taken during the current assessment period (2012 - 2018) indicate that Connies Brook should be placed on 303(d) list for chloride. Ten of 22 (45%) of the chloride samples collected in the current assessment period were above the chronic water quality criteria of 230 mg/L. Similarly, 10 out of 21 (48%) specific conductance measurements exceeded 835 uS/cm. The statewide chloride/specific conductance regression identifies 835 uS/cm as the specific conductance threshold that corresponds to chloride levels exceeding the chronic water quality criteria of 230 mg/L. Chloride samples at this site confirmed that the statewide regression is applicable. Exceedences occurred from June through October generally during periods of dry weather and low flow. Connies Brook (NHRIV700061204-06) has been changed from 3-PNS to 5-M for chloride for the aquatic life integrity designated used based on data collected during this assessment cycle.

Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters





Notes:

SpC-STATE – Specific Conductance samples to be compared using the State-wide indicator for chloride.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for addition details.

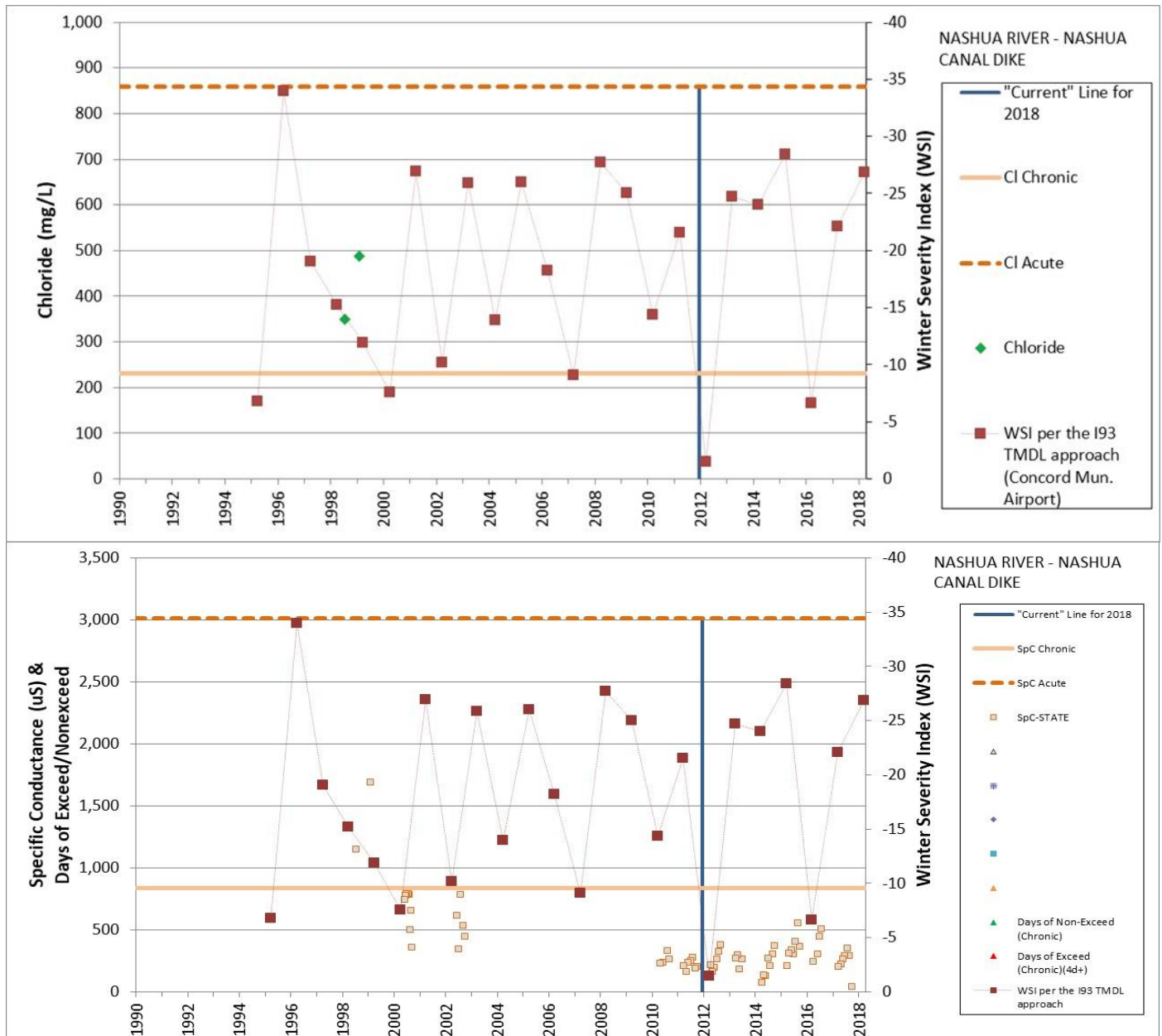
NASHUA RIVER - NASHUA CANAL DIKE (NHIMP700040402-03)

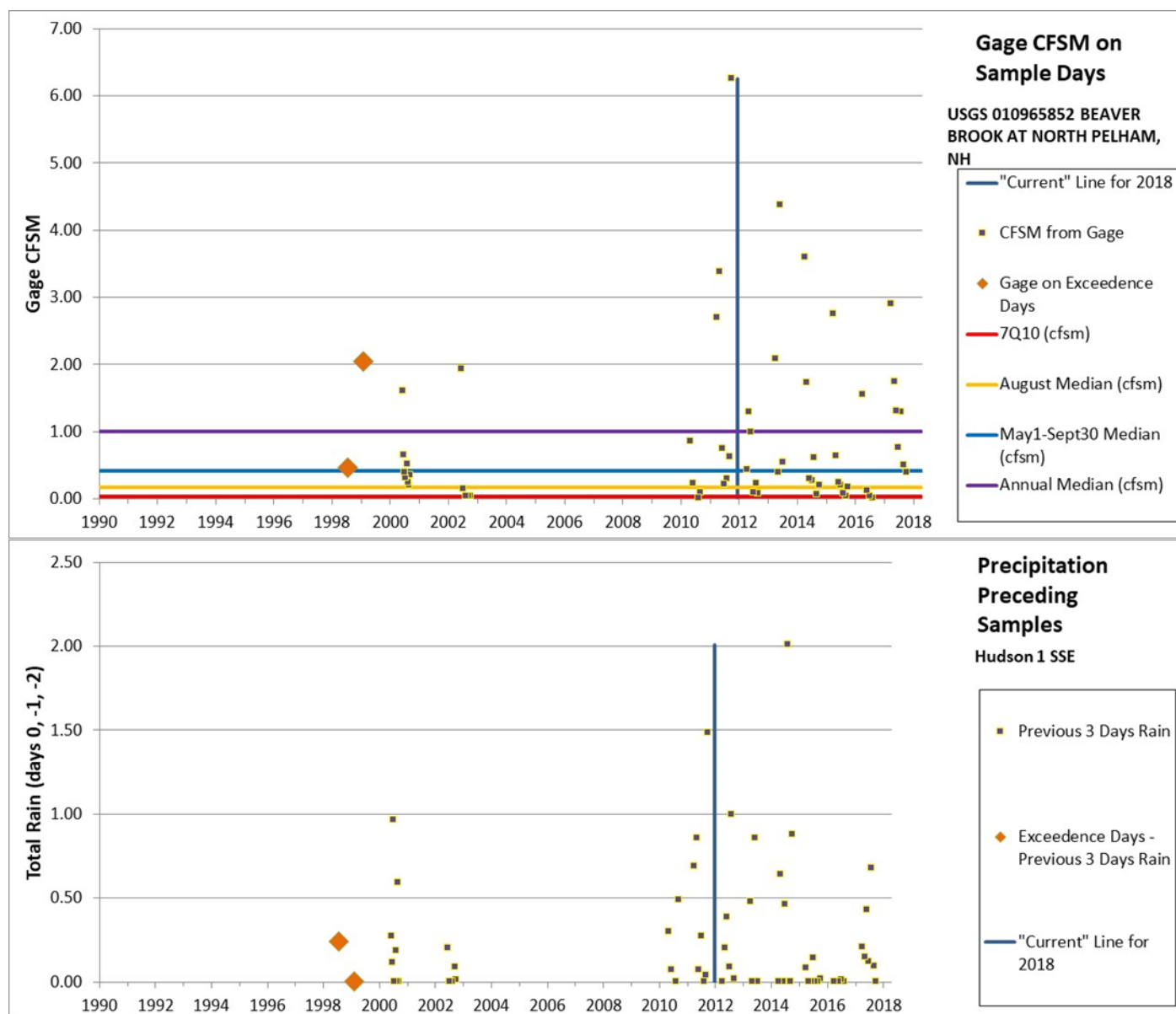
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
NASHUA RIVER - NASHUA CANAL DIKE	NHIMP700040402-03	Chloride	NASHUA	3-PAS	5-M

The Nashua River - Mine Falls Dam Pond (NHIMP700040402-02) was originally impaired for chloride for the aquatic life integrity designated use in 2006 based on data collected at station MINNASD. In 2014, it was discovered that station MINNASD was mistakenly tied to The Nashua River - Mine Falls Dam Pond (NHIMP700040402-02), but was actually located within Nashua River - Nashua Canal Dike (NHIMP700040402-03). It has since been re-associated within the

Nashua River and all the data transferred to Nashua River - Nashua Canal Dike (NHIMP700040402-03). When the data was transferred to the correct waterbody in 2014 the chloride data from 1998 and 1999, which was used to impair the Nashua River - Mine Falls Dam Pond (NHIMP700040402-02) originally, was outside of the current period and therefore not used in the assessment of Nashua River - Nashua Canal Dike (NHIMP700040402-03), hence in 2016 the AU was categorized as potentially attaining standards (3-PAS) for chloride.

Because the basis for the original impairment in 2006 was based on data not within the waterbody, and there is no additional data available, NHDES has delisted the Nashua River - Mine Falls Dam Pond (NHIMP700040402-02) for chloride for the aquatic life integrity designated use. Because there is no other data in which to make an assessment, it has been placed in category 3-ND (no current data) for the 2018 cycle. Similarly, had the data been assigned to the correct waterbody, the Nashua River - Nashua Canal Dike (NHIMP700040402-03) would have received the impairment designation in 2006. The current data from the Nashua River - Nashua Canal Dike (NHIMP700040402-03) does not provide enough information in which to lift that impairment due to different sampling stations and sampling depths, therefore, the Nashua River - Nashua Canal Dike (NHIMP700040402-03) has been moved from 3-PAS to 5-M for chloride for the aquatic life integrity designated use.





Chlorophyll-a & Total Phosphorus for Aquatic Life Integrity

LONG POND (NHLAK700061205-02-01)

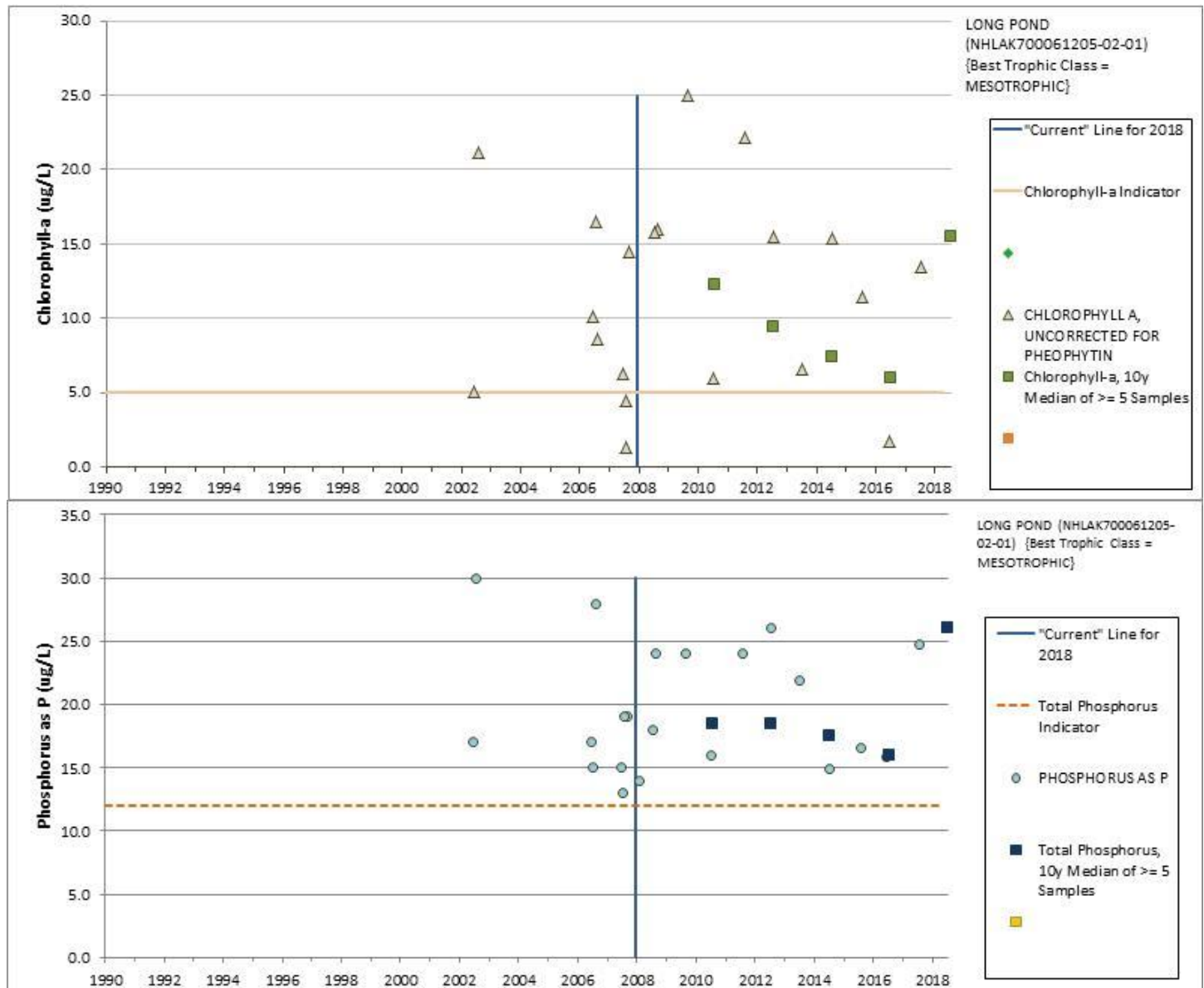
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
LONG POND	NHLAK700061205-02-01	Chlorophyll-a	Pelham	3-PNS	5-P
		Phosphorus (Total)	Pelham	5-M	5-P

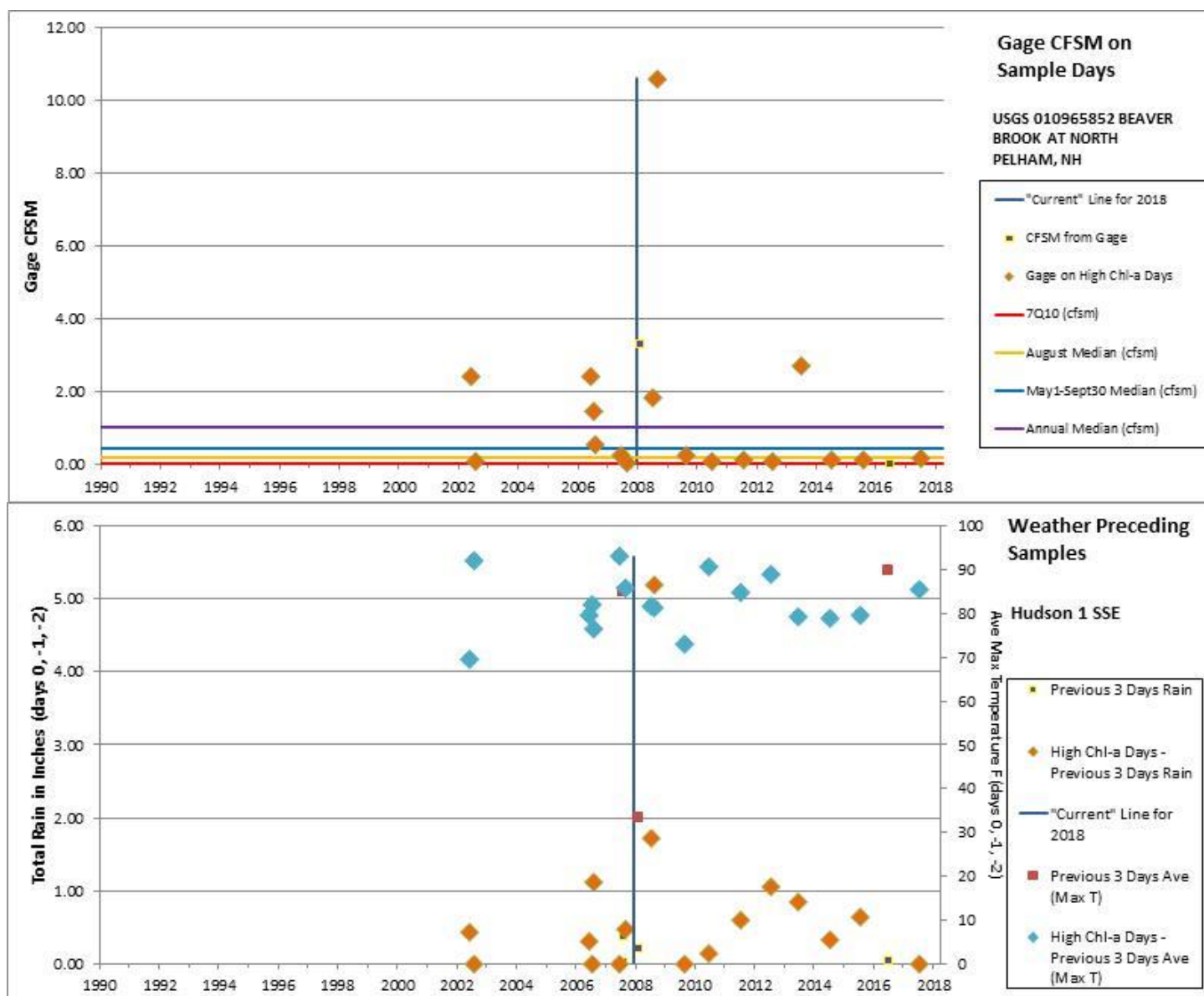
Long Pond (NHLAK700061205-02-01) was originally impaired for Chlorophyll-a for the aquatic life integrity designated use in 2010. It was accidentally de-listed (removed from the 303(d) list) during the 2016 assessment cycle because the assessment category was not changed in NHDES' Supplemental Assessment Database (SADB). The SADB was subsequently queried to build an Excel version of NHDES' Final 303(d) list, which was submitted with a collection of 303(d) related documents to EPA on November 30, 2017, and received partial approval on June 22, 2018. In their partial

approval EPA's intent was that Long Pond (NHLAK700061205-02-01) was impaired due to elevated chlorophyll-a in recognition that all the supporting documents submitted by NHDES indicated that the Long Pond was impaired.

- Waters Removed Since the 2014 Section 303(d) List summary document (<https://www.des.nh.gov/organization/divisions/water/wmb/swga/2016/documents/r-wd-17-10.pdf>)

As the EPA has not fully approved the 2016 303(d), the full database has not yet been submitted to EPA. In order to correct this SADB error the Long Pond (NHLAK700061205-02-01) assessment unit has been reset to 5-P in the SADB for Chlorophyll-a for the aquatic life integrity designated use for the 2018 cycle. Additionally, the chlorophyll-a median continues to remain above the mesotrophic threshold by a large margin in addition to the total phosphorus median also being well above the threshold. Long Pond also continues to experience annual cyanobacteria blooms during the summer. For these reasons Long Pond (NHLAK700061205-02-01) has been moved from 3-PNS to 5-P for chlorophyll-a for the aquatic life integrity designated use.





Cyanobacteria for Primary Contact Recreation

ARLINGTON MILL RESERVOIR (NHLAK700061101-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
ARLINGTON MILL RESERVOIR	NHLAK700061101-04	Cyanobacteria hepatotoxic microcystins	SALEM	N/A	5-M

A lake warning was issued in 2018, lasting 66 days. The total *Microcystis* and *Woronichinia* cell concentration was 50 million cells/mL on several dates in August through October of 2018. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, Arlington Mill Reservoir (NHLAK700061101-04) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

JERICO LAKE (NHLAK400010606-01) and JERICO MOUNTAIN STATE PARK BEACH (NHLAK400010606-01-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
JERICO LAKE	NHLAK400010606-01	Cyanobacteria	BERLIN	N/A	5-M
JERICO MOUNTAIN STATE PARK BEACH	NHLAK400010606-01-02	hepatotoxic microcystins			

A lake warning and beach advisory was issued in 2018, lasting 7 days. A sample taken from Jericho Mountain State Park Beach identified that *Anabaena* cell concentration was >3 million cells/mL on 6/26/2018. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake and the beach. Therefore, Jericho Lake (NHLAK400010606-01) and Jericho Mountain State Park Beach (NHLAK400010606-01-02) have been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

LAKE WINONA (NHLAK700020108-02-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
LAKE WINONA	NHLAK700020108-02-02	Cyanobacteria hepatotoxic microcystins	CENTER HARBOR, NEW HAMPTON	N/A	5-M

A lake warning was issued in 2018, lasting 9 days. *Anabaena* cell concentration was 1 million cells/mL on 8/28/2018. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, Lake Winona (NHLAK700020108-02-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

LILY POND (NHLAK600030802-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
LILY POND	NHLAK600030802-02	Cyanobacteria hepatotoxic microcystins	SANDOWN	N/A	5-P

A lake warning was issued in 2017, lasting 15 days. *Oscillatoria* cell concentration was 1.5 billion cells/mL on 8/23/2017. A bloom was reported again in 2018, but no advisory was issued as NHDES did not get confirmation with a sample before it had dissipated. The 2017 cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, Lily Pond (NHLAK600030802-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

LITTLE ISLAND POND (NHLAK700061204-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
LITTLE ISLAND POND	NHLAK700061204-02	Cyanobacteria hepatotoxic microcystins	PELHAM	N/A	5-M

A lake warning was issued in 2017, lasting 7 days. *Microcystis* cell concentration was 7 million cells/mL on 7/31/2017. A bloom was reported again in 2018. Though no advisory was issued in 2018 as it had dissipated before NHDES could grab a sample. A resident on the pond reported that she sees it along her private beach every year. The 2017 cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of

the lake. Therefore, Little Island Pond (NHLAK700061204-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

MARSH POND (NHIMP700020102-01-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
MARSH POND	NHIMP700020102-01-02	Cyanobacteria hepatotoxic microcystins	NEW DURHAM, ALTON	N/A	5-M

A lake warning was issued in 2018, lasting 70 days. *Oscillatoria* cell concentration was 3 million cells/mL on 9/6/2018. Total counts were from a deep layer bloom, though this bloom would regularly surface in the early morning hours, visually appearing to be in concentrations that may exceed the 3 million cells/mL recorded on 9/6/2018. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, Marsh Pond (NHIMP700020102-01-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

MIDDLE DANFORTH POND (NHLAK600020803-01-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
MIDDLE DANFORTH POND	NHLAK600020803-01-02	Cyanobacteria hepatotoxic microcystins	FREEDOM	N/A	5-M

There were two lake warnings issued in 2018, lasting 6 and 33 days. The first lake warning was issued on 8/16/2018 following a total cell concentration reported as too numerous to count. The second lake warning was issued on 8/24/2018 following a total cell concentration reported as 50 million cells/mL. Cyanobacteria taxa identified included *Oscillatoria* and *Anabaena*. The cyanobacteria blooms occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, Middle Danforth Pond (NHLAK600020803-01-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

MILL POND (NHLAK700020102-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
Mill Pond	NHLAK700020102-04	Cyanobacteria hepatotoxic microcystins	ALTON	N/A	5-M

A cyanobacteria bloom was documented in 2018 lasting approximately 14 days. The maximum total cell concentration reported was 300,000 cells/mL on 9/17/2018. Cyanobacteria taxa identified included *Microcystis*, *Aphanocapsa* and *Gloeocapsa*. Subsequent analysis indicates that the Microcystin toxin (the one toxin for which NHDES can test) was present in the sample. It should be noted that the waterbody is relatively shallow and not used significantly for swimming. However, it is a popular fishing location that is frequently accessed through wading by many anglers. It has also been noted that the Alton Fire Department occasionally withdrew water from the pond to use during training exercises. This practice has the potential to aerosolize any toxic algae present, which prompted NHDES to suggest this practice be curtailed. During conversation with the Alton Fire Department comments were made that the pond has been "green for years", indicating that although 2018 was the first year in which NHDES documented a cyanobacteria bloom it has most likely been occurring for many years. Additionally, a failing septic system at a commercial laundromat was discovered in the early 1980s, which was found to be discharging high concentrations of phosphorus and bacteria into the pond. It's possible that these compounds could have build-up in the sediment, helping contribute to the growth of cyanobacteria. Preliminary data from recent samples analyzed by UNH reportedly indicate elevated phosphorus

concentrations within the pond. Much of the aforementioned information was conveyed to NHDES through public comments received on the draft, 2018 303(d) List. This new information gave NHDES a better understanding of the frequency and duration of blooms, the likelihood of citizens to report a bloom, and some historical context on potential causes. It is for these reasons and the fact that the 2018 cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake, that Mill Pond (NHLAK700020102-04) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

NASHUA RIVER - MINE FALLS DAM POND (NHIMP700040402-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
NASHUA RIVER - MINE FALLS DAM POND	NHIMP700040402-02	Cyanobacteria hepatotoxic microcystins	NASHUA	N/A	5-M

A lake warning was issued in 2018, lasting 20 days. The maximum total cell concentration reported was 50 million cells/mL on 8/3/2018. Cyanobacteria taxa identified included *Oscillatoria*, *Lyngbya*, *Woronichinia*. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, the Nashua River - Mine Falls Dam Pond (NHIMP700040402-02) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

NEW POND (NHLAK700060201-03)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
NEW POND	NHLAK700060201-03	Cyanobacteria hepatotoxic microcystins	CANTERBURY	N/A	5-M

A lake warning was issued in 2018, lasting 19 days. Combined *Anabaena*, *Microcystis*, and *Oscillatoria* cell concentration was 522,500 cells/mL on 7/19/2018. Cyanobacteria was observed primarily at New Pond-Sherwood Forest Shores Beach 3 (NHLAK700060201-03-03), but there was also a large presence of benthic cyanobacteria along New Pond-Sherwood Forest Shores Beach 1 (NHLAK700060201-03-01) and New Pond-Sherwood Forest Shores Beach 2 (NHLAK700060201-03-02). Benthic mats of cyanobacteria can be easily kicked up by swimmers, or directly consumed by dogs/pets. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. Therefore, New Pond (NHLAK700060201-03) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

PAUGUS BAY (NHLAK700020110-02-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
PAUGUS BAY	NHLAK700020110-02-01	Cyanobacteria hepatotoxic microcystins	LACONIA	N/A	5-M

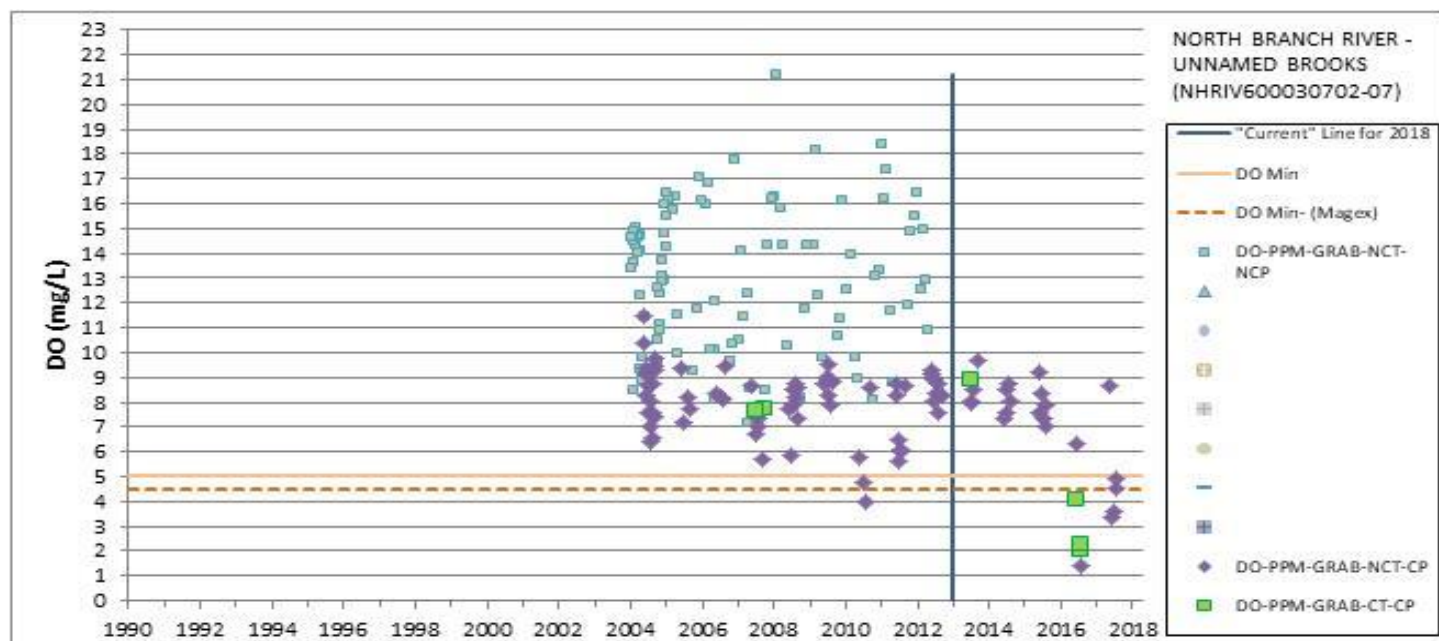
A lake warning was issued in 2018, lasting 41 days. Total combined *Microcystis*, *Woronichinia*, and *Anabaena* cell concentration was 5 million cells/mL on 6/28/2018. The cyanobacteria bloom occurred in amounts and for a duration that significantly interfered with the primary contact recreational use of the lake. It should be noted that the bloom occurred in the Weirs Channel, which is in an area of Paugus Bay with very heavy boat traffic and limited swimming. However, due to the likelihood of the cyanobacteria spreading due to wind and wave action by passing boats, the lake warning was issued. Therefore, Paugus Bay (NHLAK700020110-02-01) has been placed in category 5-M for cyanobacteria hepatotoxic microcystins for the primary contact recreation designated use.

Dissolved Oxygen for Aquatic Life Integrity

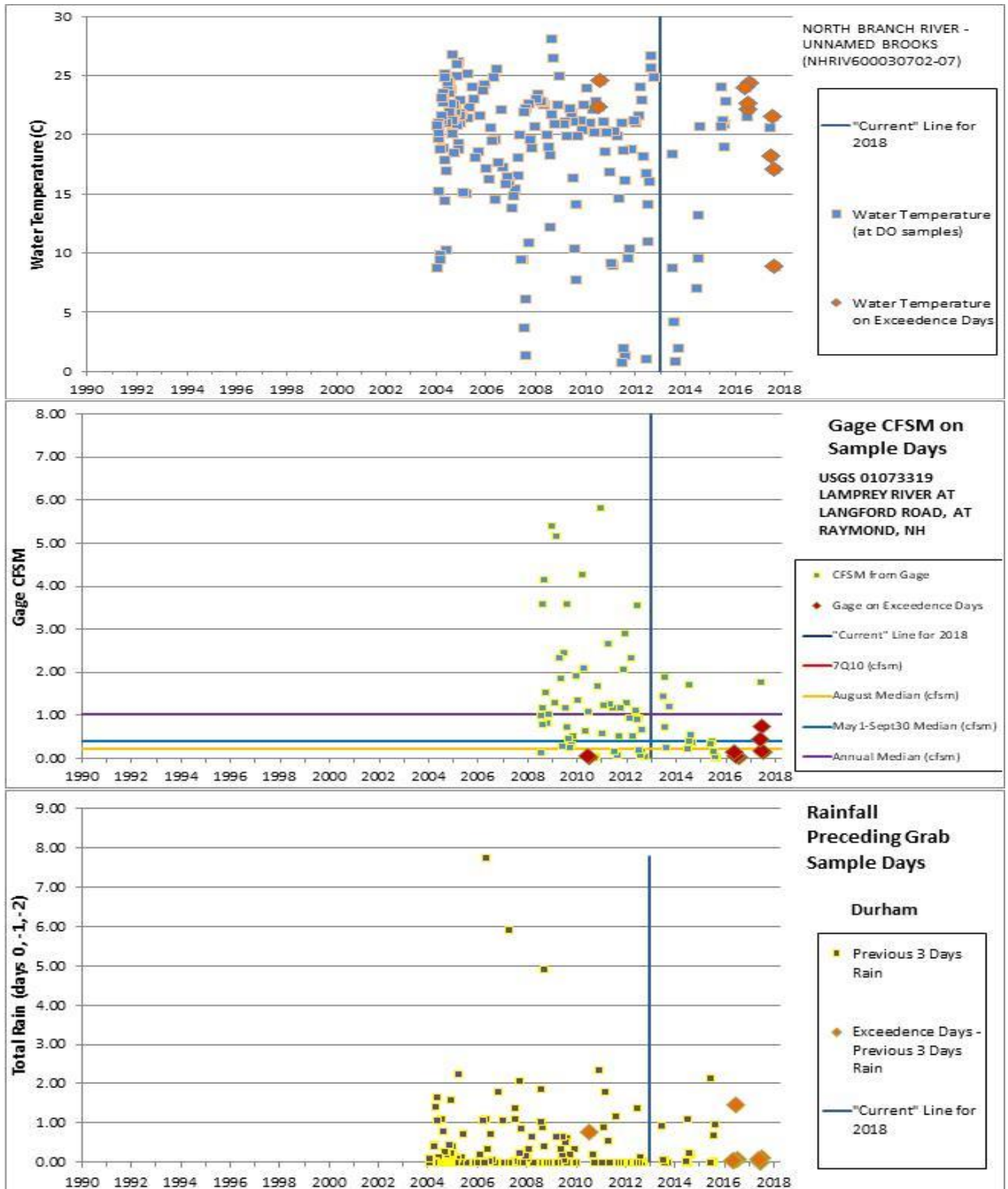
NORTH BRANCH RIVER - UNNAMED BROOKS (NHRIV600030702-07)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
NORTH BRANCH RIVER - UNNAMED BROOKS	NHRIV600030702-07	Oxygen, Dissolved	CANDIA, DEERFIELD	3-PNS	5-P

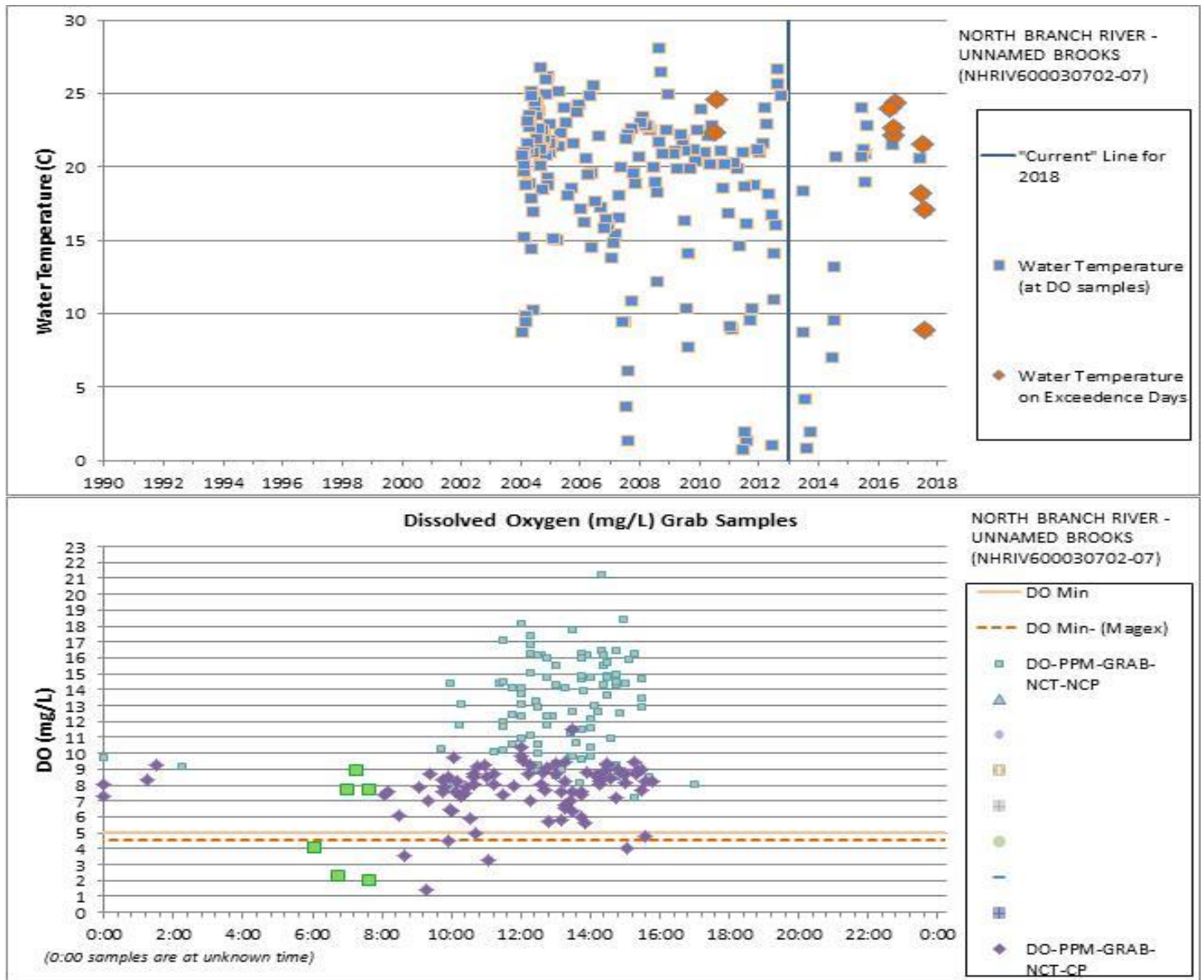
Eight of the 26 (31%) dissolved oxygen concentrations collected at station 01-NBR were below the threshold of 5.0 mg/L, three of which were under 3.0 mg/L. While the older data demonstrated dissolved oxygen greater than 5 mg/L the water was often super-saturated. The newer datasets since 2012 have been more often collected in the early morning hours when we would expect respiration to draw dissolved oxygen concentrations down. In that newer data three of the low dissolved oxygen samples were taken during the critical time and critical period while the other five were taken only during the critical period. It should be noted that the older data was collected at station NBR12 while the newer data was collected at 01-NBR. These station are essentially the same, but were collected by different organizations so they received different site IDs. The low dissolved oxygen samples during the current assessment period (2013-2018) were collected with 3-day rainfall totals between 0.06 - 1.46 inches, water temperatures ranging from 9-24 degrees C, and with flows at the Lamprey River gage (01073319) < 0.75 cfs. The North Branch River (NHRIV600030702-07) has been moved from 3-PNS to 5-P for dissolved oxygen for the aquatic life integrity designated use based on data collected in the current assessment period.

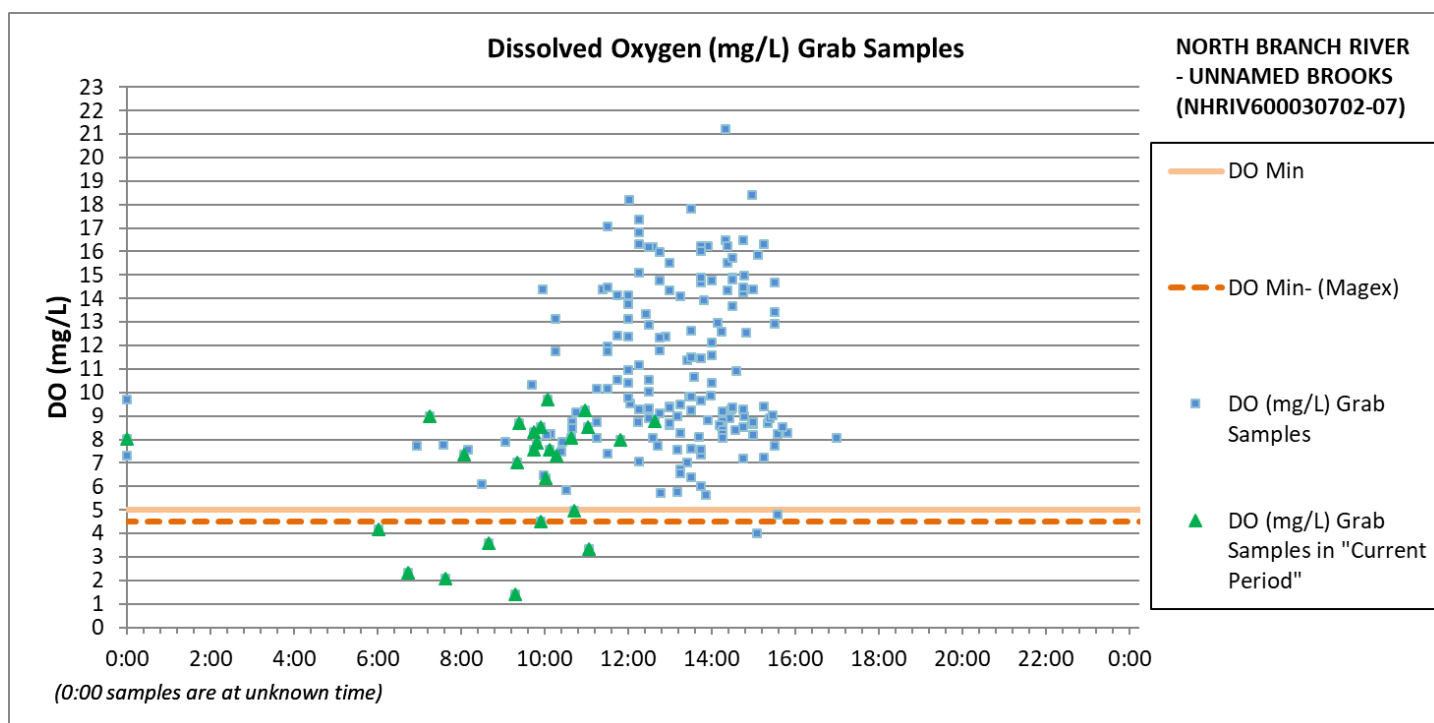


Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters



Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters





Notes:

DO-PPM-GRAB-CT-CP = Grab samples of dissolved oxygen during the early morning hours of the summer critical period.

DO-PPM-GRAB-CT-NCP = Grab samples of dissolved oxygen during the early morning hours and not during the summer critical period.

DO-PPM-GRAB-NCT-CP = Grab samples of dissolved oxygen not in the early morning hours of the summer critical period.

DO-PPM-GRAB-NCT-NCP = Grab samples of dissolved oxygen not in the early morning hours and outside the summer critical period.

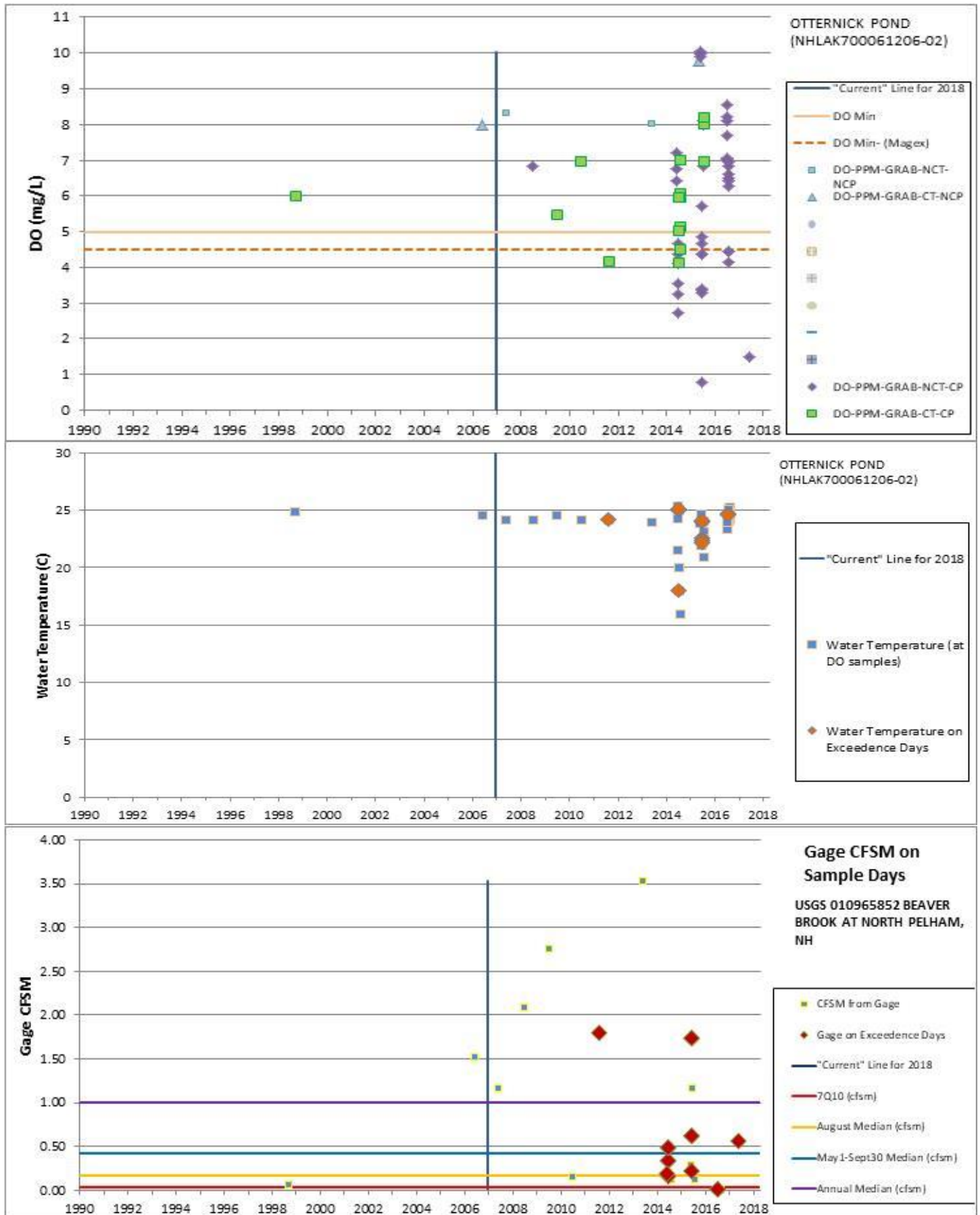
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for addition details.

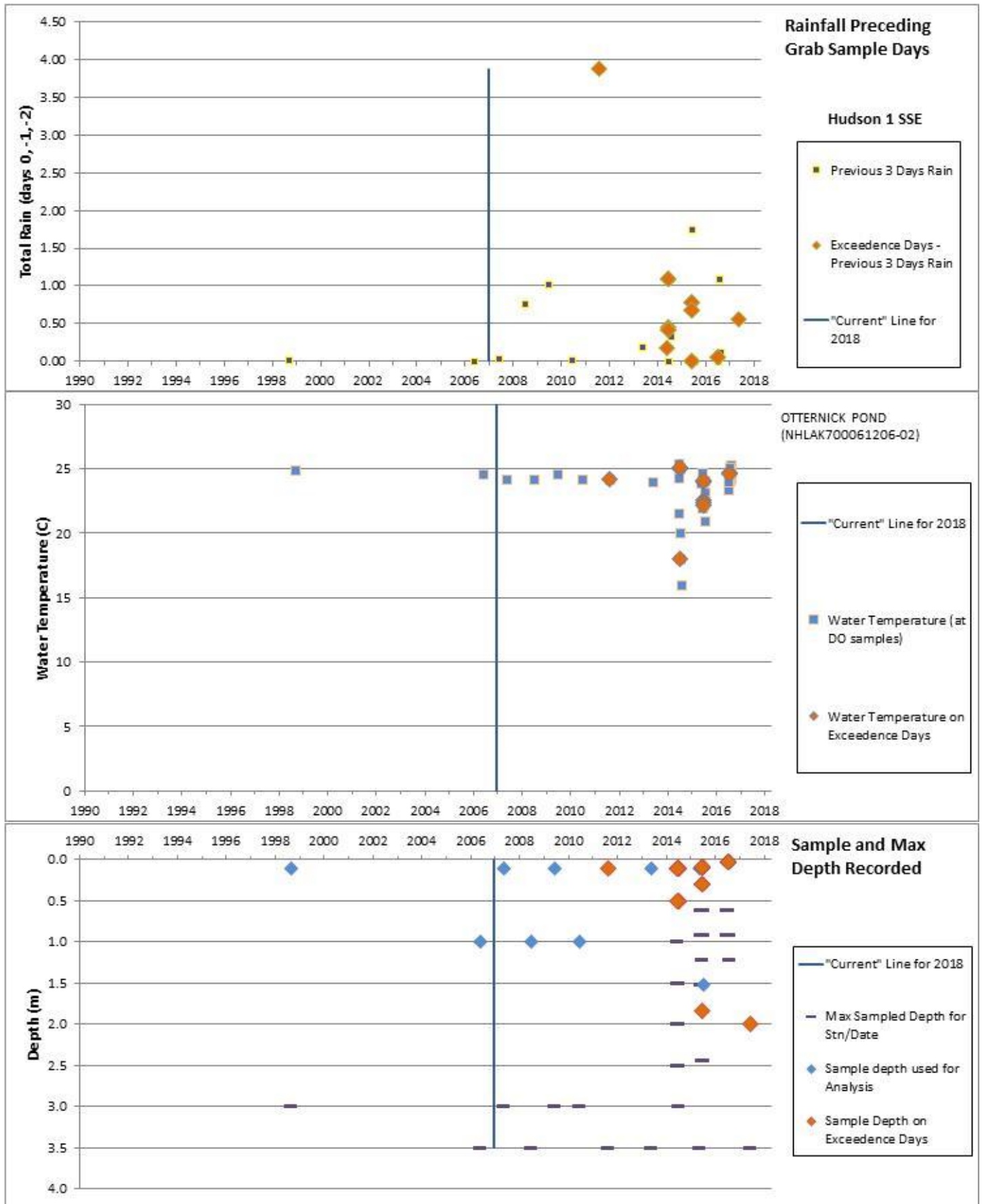
OTTERNICK POND (NHLAK700061206-02)

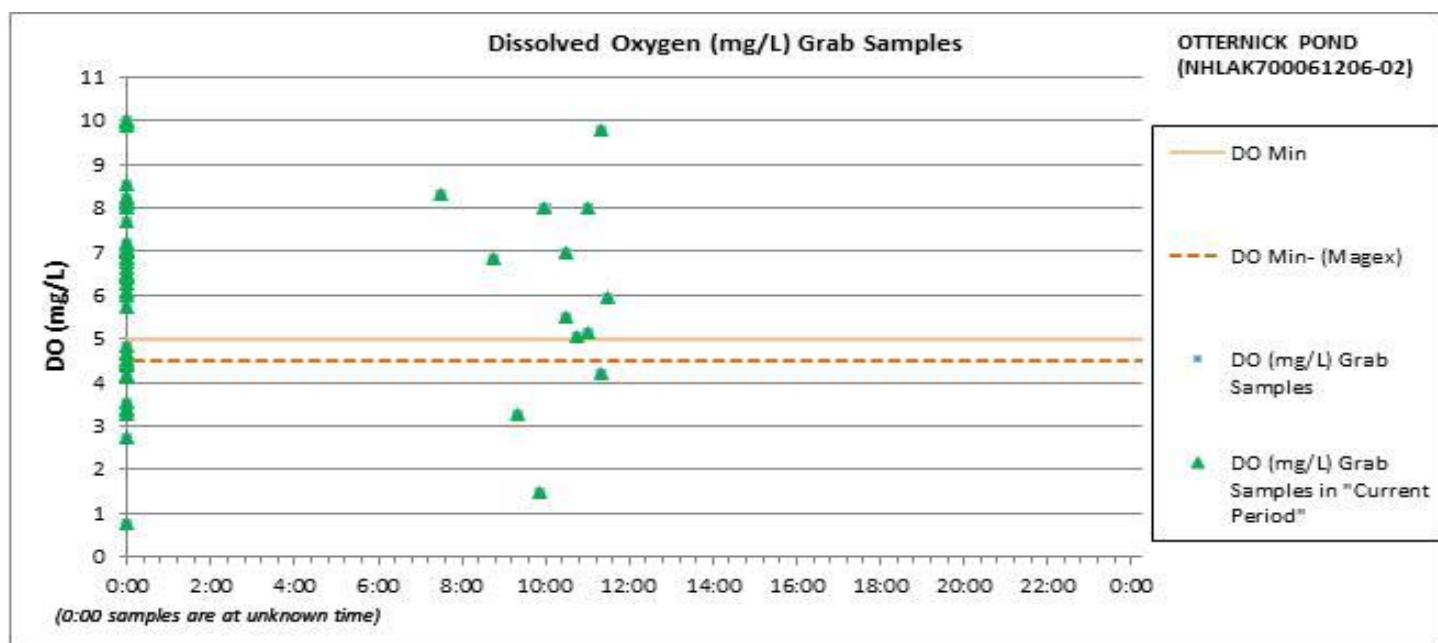
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
OTTERNICK POND	NHLAK700061206-02	Oxygen, Dissolved	HUDSON	3-PNS	5-P

This pond is a Class B waterbody, 40.1 acres in size, shallow, with significant organic matter throughout the basin. Sixty data points were used in the assessment, some from the deep spot of the basin (OTTHUDD), others from other sample sites in the near-shore zone of the basin (OTTHUD 1-4). Of these, 15 (25%) exceeded the magnitude of exceedence for dissolved oxygen (<4.5 mg/L). The samples collected at the deep spot showed that 8 of samples are within acceptable dissolved oxygen concentrations, and two were not. Of the 50 data points not collected at the deep spot (and not stratified sites), 14 were above the magnitude of exceedence. Exceedences occurred at a range of temperatures (generally greater than 15 degrees Celsius, and at a range of flow regimes (0.01 to 1.8 CFSM based on USGS Beaver Brook gage in North Pelham, 010965852). Given the number of exceedences at this site, across multiple sample locations over time, Otternick Pond in Hudson is categorized as 5-P in the 2018 assessment cycle.

Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters







Notes:

DO-PPM-GRAB-CT-CP = Grab samples of dissolved oxygen during the early morning hours of the summer critical period.

DO-PPM-GRAB-CT-NCP = Grab samples of dissolved oxygen during the early morning hours and not during the summer critical period.

DO-PPM-GRAB-NCT-CP = Grab samples of dissolved oxygen not in the early morning hours of the summer critical period.

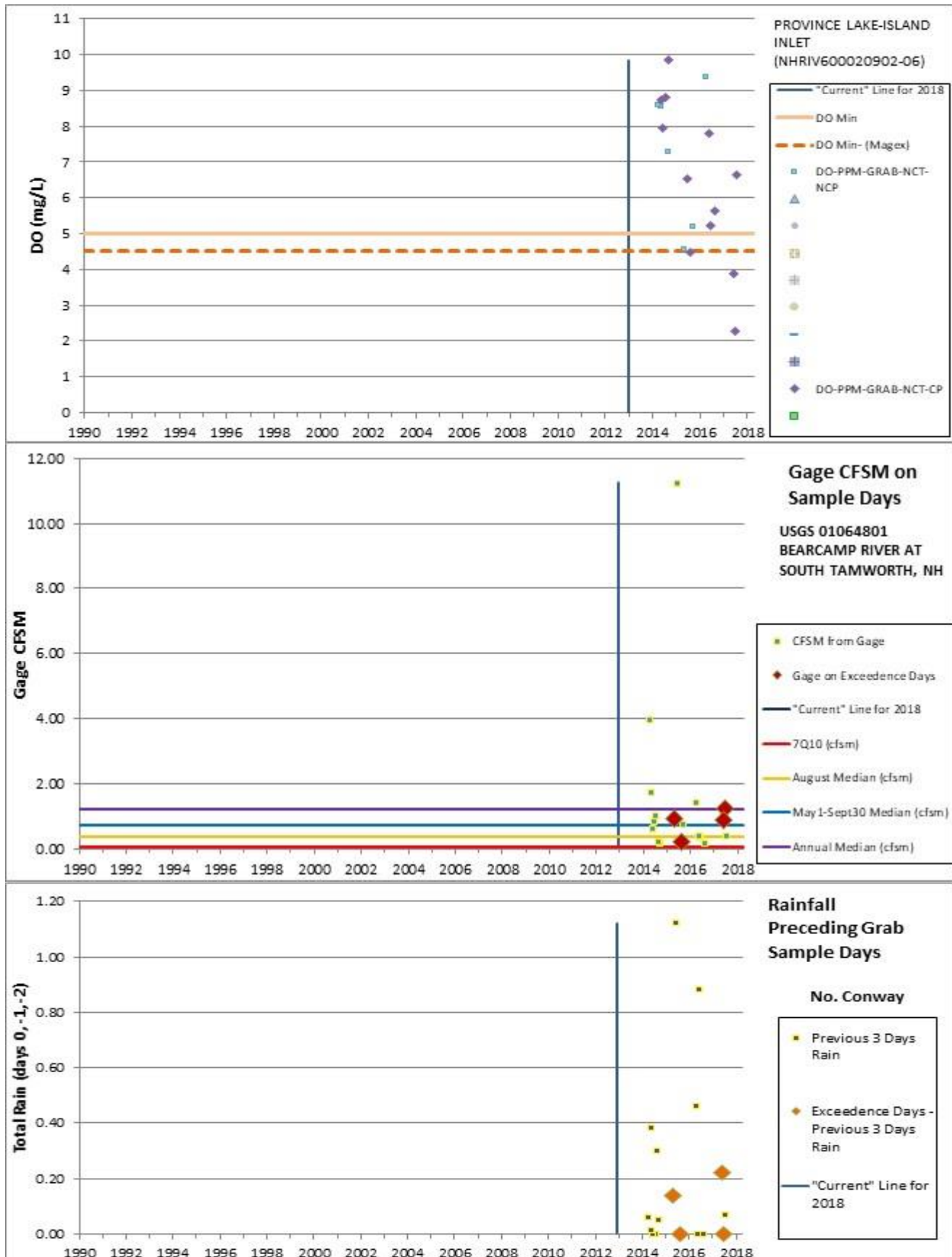
DO-PPM-GRAB-NCT-NCP = Grab samples of dissolved oxygen not in the early morning hours and outside the summer critical period.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for addition details.

PROVINCE LAKE-ISLAND INLET (NHRIV600020902-06)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary		
			Town Listed First	2016	2018
PROVINCE LAKE-ISLAND INLET	NHRIV600020902-06	Oxygen, Dissolved	WAKEFIELD	3-PNS	5-P

Data collected during the current assessment period (2013-2018) at station PROEFFI, indicates that the Province Lake, Island inlet periodically has dissolved oxygen concentrations below 5.0 mg/L (4 of 18, or 22%), and on occasion the concentrations fall below 4.0 mg/L. The low dissolved oxygen samples were collected while flows were < 1.22 cfs at the Bearcamp River gage (summer median = 0.71 cfs, August median = 0.37 cfs) (01064801), and with 3-day rainfall totals between < 0.5 inches. The Province Lake, Island inlet (NHRIV600020902-06) has been moved from category 3-PNS to 5-P for dissolved oxygen for the aquatic life integrity designated use based on data collected in the current assessment period.



Notes:

DO-PPM-GRAB-CT-CP = Grab samples of dissolved oxygen during the early morning hours of the summer critical period.

DO-PPM-GRAB-CT-NCP = Grab samples of dissolved oxygen during the early morning hours and not during the summer critical period.

DO-PPM-GRAB-NCT-CP = Grab samples of dissolved oxygen not in the early morning hours of the summer critical period.

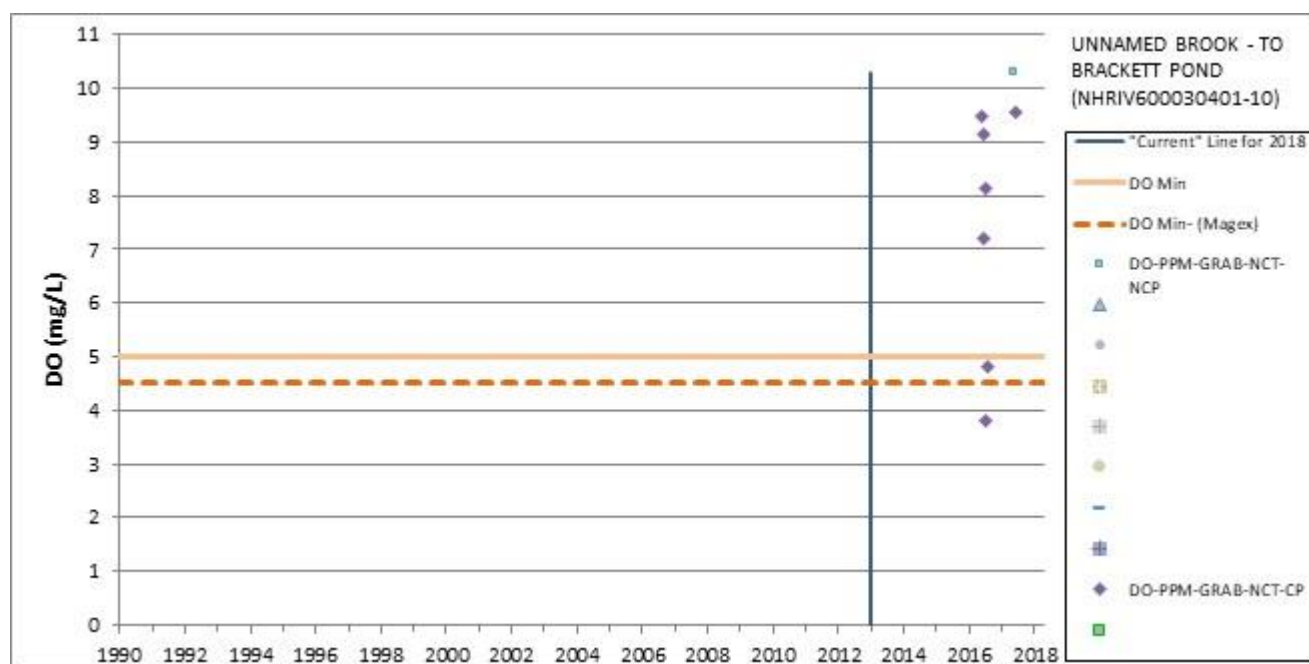
DO-PPM-GRAB-NCT-NCP = Grab samples of dissolved oxygen not in the early morning hours and outside the summer critical period.

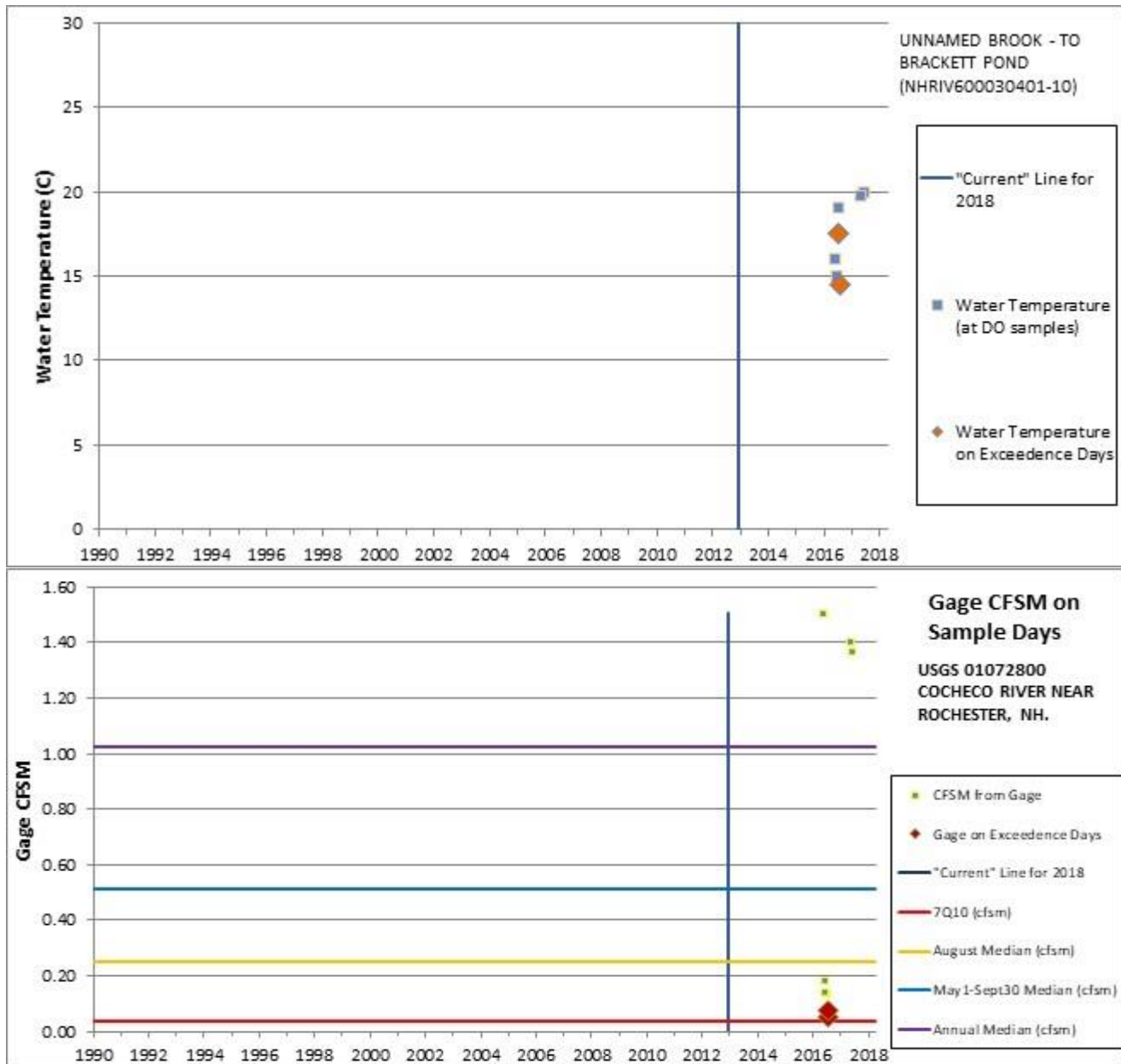
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for addition details.

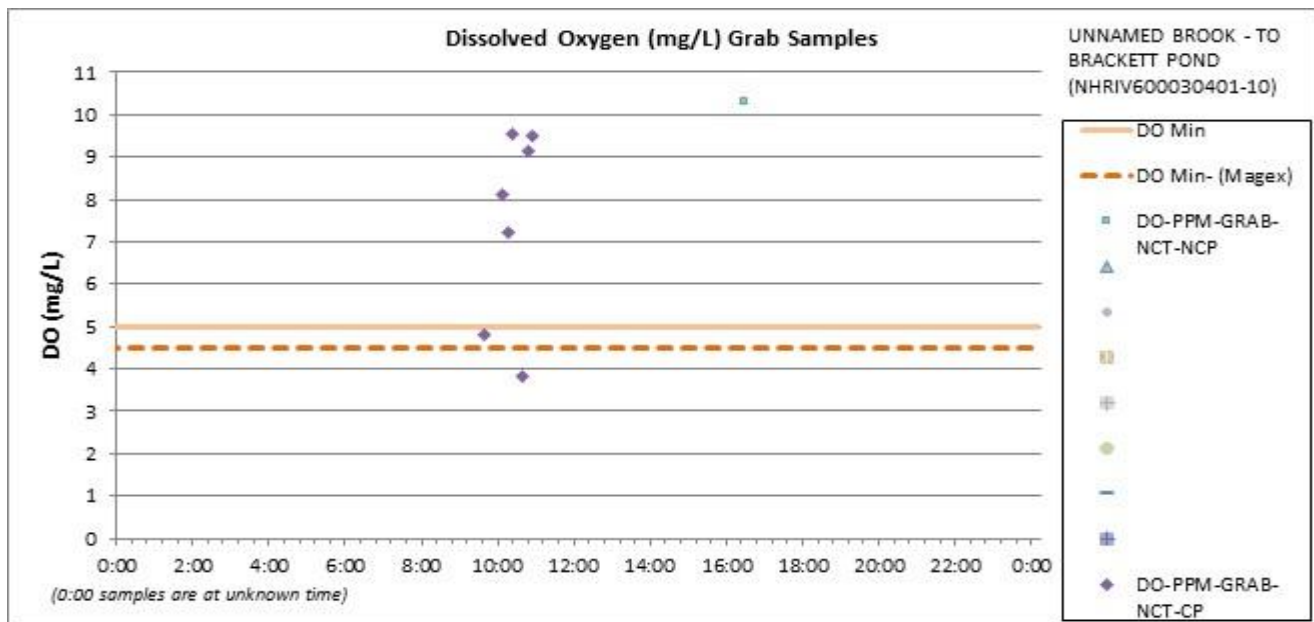
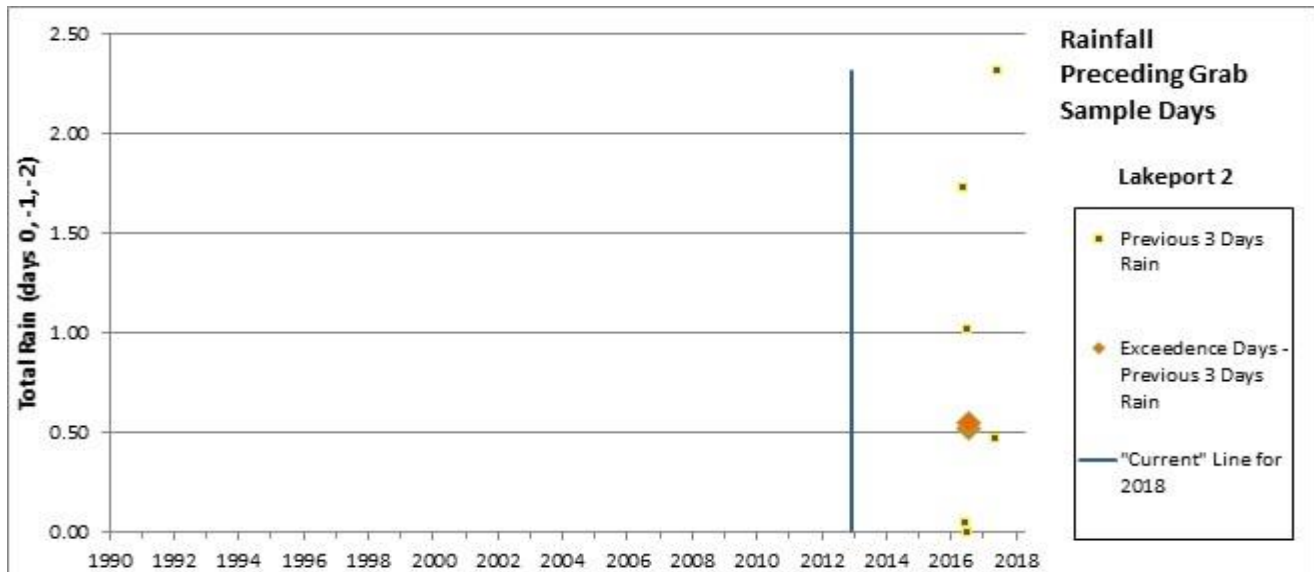
UNNAMED BROOK - TO BRACKETT POND (NHRIV600030401-10)

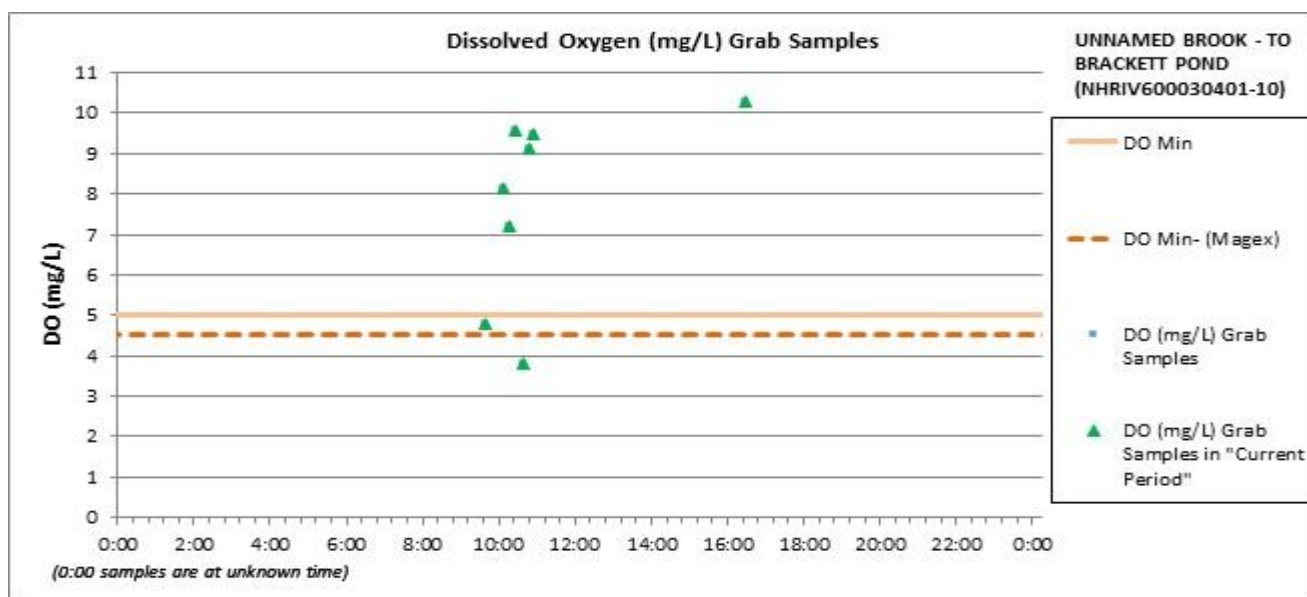
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary		
			Town Listed First	2016	2018
UNNAMED BROOK - TO BRACKETT POND	NHRIV600030401-10	Oxygen, Dissolved	WAKEFIELD	3-PNS	5-M

Two of the eight (25%) dissolved oxygen concentrations collected at station LOVWAKB were below the threshold of 5.0 mg/L, one of which was under 4.0 mg/L. The low dissolved oxygen samples during the current assessment period (2013-2018) were collected with 3-day rainfall totals around 0.5 inches, water temperatures ranging from 14-18 degrees C, and with flows at the Cocheco River gage (01072800) < 0.2 cfs. The Unnamed Brook to Brackett Pond (NHRIV600030401-10) has been moved from 3-PNS to 5-M for dissolved oxygen for the aquatic life integrity designated use based on data collected in the current assessment period.









Notes:

DO-PPM-GRAB-CT-CP = Grab samples of dissolved oxygen during the early morning hours of the summer critical period.

DO-PPM-GRAB-CT-NCP = Grab samples of dissolved oxygen during the early morning hours and not during the summer critical period.

DO-PPM-GRAB-NCT-CP = Grab samples of dissolved oxygen not in the early morning hours of the summer critical period.

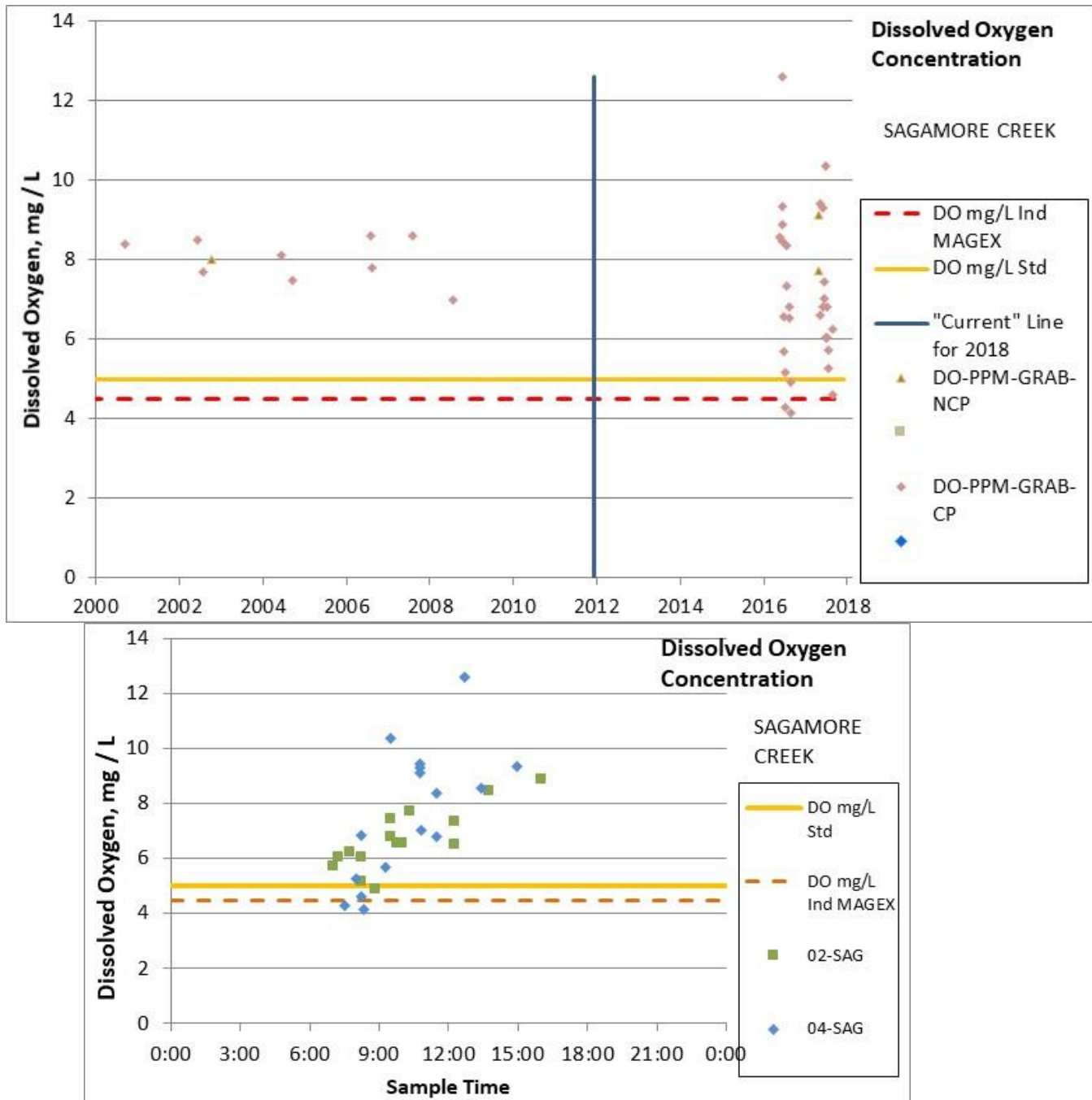
DO-PPM-GRAB-NCT-NCP = Grab samples of dissolved oxygen not in the early morning hours and outside the summer critical period.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for addition details.

UPPER SAGAMORE CREEK (NHEST600031001-03) and LOWER SAGAMORE CREEK (NHEST600031001-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
UPPER SAGAMORE CREEK	NHEST600031001-03	Oxygen,	PORTSMOUTH,	2-M	5-M
LOWER SAGAMORE CREEK	NHEST600031001-04	Dissolved	NEW CASTLE, RYE		

Four of the 31 (13%) grab samples collected were below 5 mg/L and 2 of those measurements were below 4.5 mg/L. Low values were consistently early in the day. Three of the 4 low readings were at 04-SAG which is the Route 1B bridge site. The fourth low reading was at 02-SAG (the Route 1A bridge) on the same date as one of the 04-SAG low readings but not as low. Typically, we find that grab samples under-estimate the frequency and magnitude of degraded water quality. Given that on one of the sample dates we see that the below 5 mg/L readings extended through the upstream mile of the a 2-mile-long estuary, the timing of the low DO values, the percent of low DO samples, that the low values were reported in both of the sampled years, and that grab samples under-estimate the frequency and magnitude of degraded water quality assessment zone has been added to the 303(d) list due to low dissolved oxygen concentration.



Estuarine Bioassessments (Eelgrass) for Aquatic Life Integrity

SQUAMSCOTT RIVER NORTH (NHEST600030806-01-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
SQUAMSCOTT RIVER NORTH	NHEST600030806-01-02	Estuarine Bioassessments	STRATHAM, NEWFIELDS	3-PNS	5-P

On October 14, 2015, the New Hampshire Department of Environmental Services (NHDES) released the Draft 2014 303(d) List of impaired waters for public comment. Public comments were accepted through the close of business on December 11, 2015. In response to the public comments received, NHDES reverted the draft 2014 Estuarine Bioassessments for the Aquatic Life Integrity designated use for the Squamscott River North (NHEST600030806-01-02) from category 3-PNS to 5-P. Although the change was incorporated into the final Technical Support Document for the Great Bay Estuary, it was not changed in NHDES' Supplemental Assessment Database (SADB). The SADB was subsequently queried to build an Excel version of NHDES' Final 303(d) list, which was submitted with a collection of 303(d) related documents to EPA on March 27, 2017 and received partial approval on March 16, 2018. In their partial approval, EPA's intent was that the Squamscott River North (NHEST600030806-01-02) was impaired due to poor Estuarine Bioassessments in recognition that all the supporting documents submitted by NHDES indicated that the Squamscott River North was impaired.

- Impairments Added to the 2014 305(b)/303(d) document (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-16.pdf>),
- Waters Removed Since the 2012 Section 303(d) List summary document (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-14.pdf>),
- Response to Comments on the Draft Section 303(d) List of Threatened or Impaired Waters (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-17-01.pdf>), and
- Technical Support Document for the Great Bay Estuary Aquatic Life Use Support Assessments, 2014 305(b) Report/303(d) List (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-12.pdf>).

As the EPA has not fully approved the 2014 303(d), the full database has not yet been submitted to EPA. This incorrect assessment category in the SADB was carried through the 2016 cycle and not discovered by NHDES until the 2018 assessments. In order to correct this SADB error, the Squamscott River North (NHEST600030806-01-02) assessment unit has been reset to 5-P in the SADB for Estuarine Bioassessments for the aquatic life integrity designated use for the 2018 cycle. A full description of the rationale used to make the assessment determination for this waterbody is provided in the Technical Support Document for the Great Bay Estuary Aquatic Life Integrity Use Support Assessments, 2018 305(b) Report/303(d) List (<http://des.nh.gov/organization/divisions/water/wmb/swqa/2018/index.htm>).

Macroinvertebrates for Aquatic Life Integrity

JEWETT BROOK (NHRIV700020201-16)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
Jewett Brook	NHRIV700020201-16	Benthic-Macroinvertebrate Bioassessments (Streams)	GILFORD, LACONIA	3-PNS	5-P

Four invertebrate samples have been collected since 2013. B-IBI ratios of all four samples (0.71 – 0.87) have been well below B-IBI ratio of 1.0. B-IBI ratios (B-IBI Score/ B-IBI Threshold) less than 1.0 indicate the invertebrate community fails to meet the narrative aquatic life use water quality criteria. Jewett Brook (NHRIV700020201-16) has been moved from 3-PNS to 5-P for Benthic-Macroinvertebrate Bioassessments (Streams) for the aquatic life integrity designated use based on data collected in the current assessment period.

Waterbody	Station ID	Activity ID	Collection Date	B-IBI Threshold	B-IBI Score	B-IBI ratio
Jewett Brook	01-JWT	BEN-01-JWT-04	9/25/2017	56.7	40.18	0.71
Jewett Brook	01-JWT	BEN-01-JWT-03	9/27/2016	56.7	46.69	0.82

Jewett Brook	01-JWT	BEN-01-JWT-02	9/25/2015	56.7	48.60	0.86
Jewett Brook	01-JWT	BEN-01-JWT-01	9/26/2013	56.7	49.14	0.87

PENNICHUCK BROOK (NHRIV700061001-10)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
Pennichuck Brook	NHRIV700061001-10	Benthic-Macroinvertebrate Bioassessments (Streams)	MERRIMACK, NASHUA	3-ND	5-P

One invertebrate sample was collected in 2015 with a B-IBI ratio equal to 0.52, well below the B-IBI threshold of 1.0. B-IBI ratios (B-IBI Score/ B-IBI Threshold) less than 1.0 indicate the invertebrate community fails to meet the narrative aquatic life use water quality criteria. Pennichuck Brook (NHRIV700061001-10) has been moved from 3-ND to 5-P for Benthic-Macroinvertebrate Bioassessments (Streams) for the aquatic life integrity designated use based on data collected in the current assessment period.

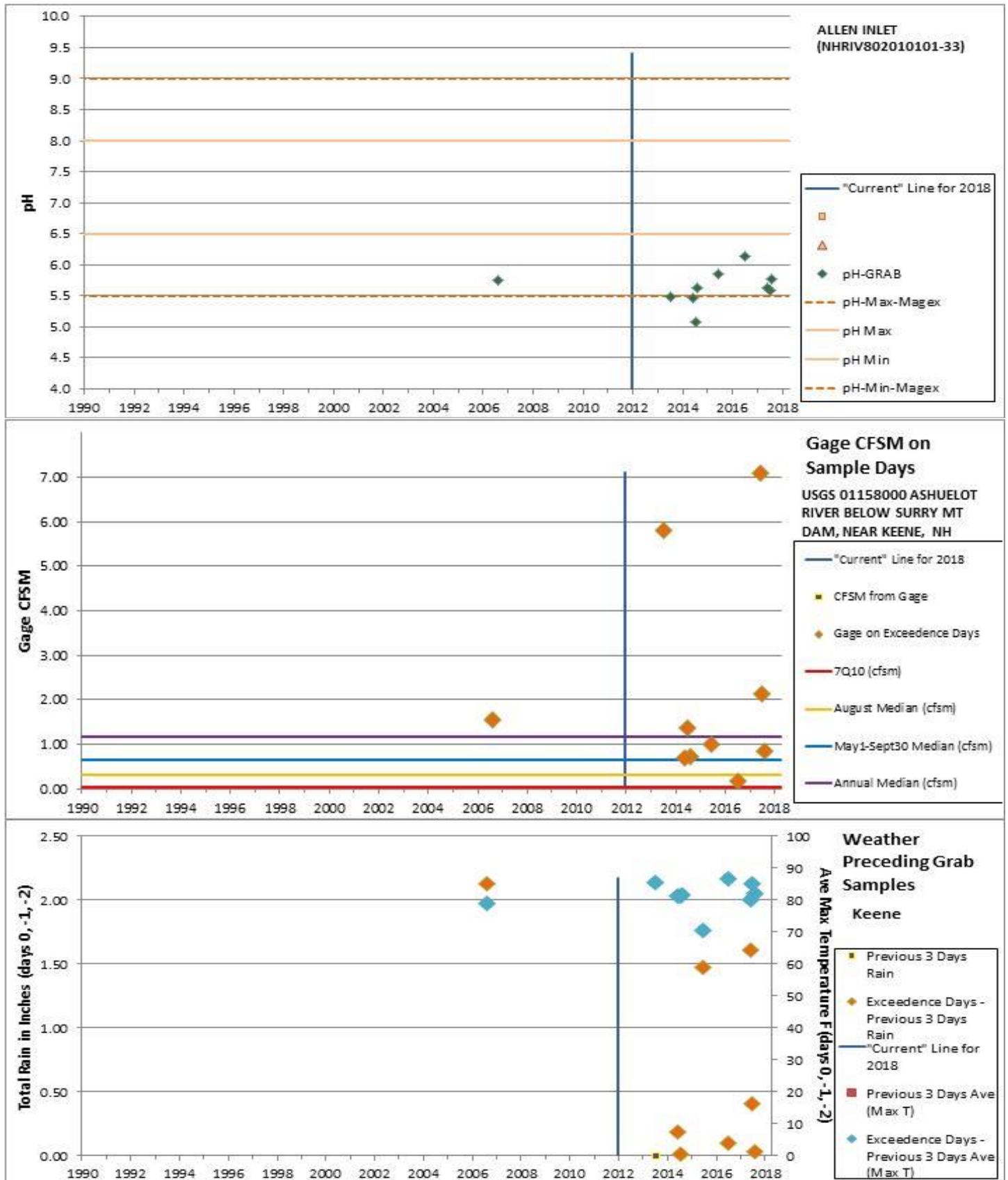
Waterbody	Station ID	Activity ID	Collection Date	B-IBI Threshold	B-IBI Score	B-IBI ratio
Pennichuck Brook	01-PEN	BEN-NHLS-1049-01	9/24/2015	53.1	27.49	0.52

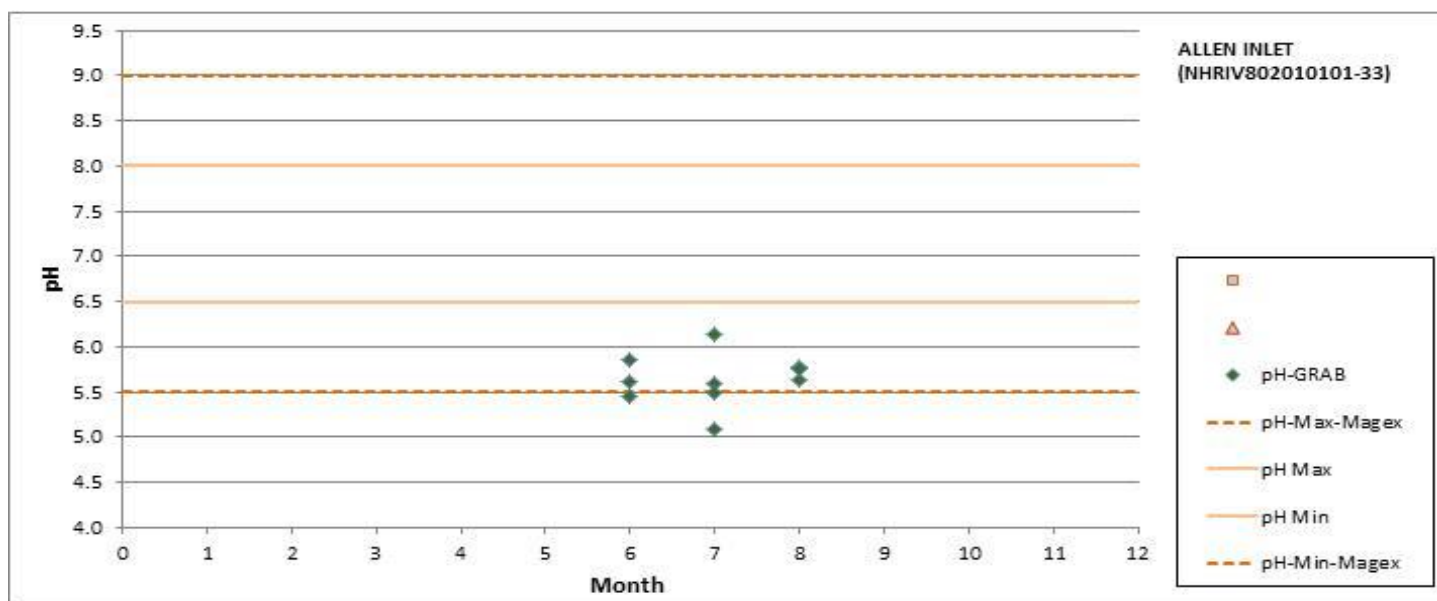
pH for Aquatic Life Integrity

ALLEN INLET (NHRIV802010101-33)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
ALLEN INLET	NHRIV802010101-33	pH	LEMPSTER	3-PNS	5-P

Ten grab samples at station SANMLWAI were collected in June through August of 2013 – 2017. Flows ranged from 0.17 – 7.11 cfs from the Ashuelot River below Surry Mt Dam gage (01158000) and during variable weather conditions (0 – 2.13 inches previous three-day rain). All 10 samples (100%) had a pH lower than 6.5 and 3 samples (30%) were below the magex threshold of 5.5 although, two of the three samples below the magex threshold were very close to the pH minimum magex threshold at 5.46 and 5.49. Allen Inlet (NHRIV802010101-33) has been moved from 3-ND to 5-P for pH for the aquatic life integrity designated use as the additional sampling demonstrated that pH values are below the 6.5 threshold and more than 10% of samples are below the magex threshold of 5.5.





Notes:

pH-GRAB = pH value from a grab sample.

“Magex” refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

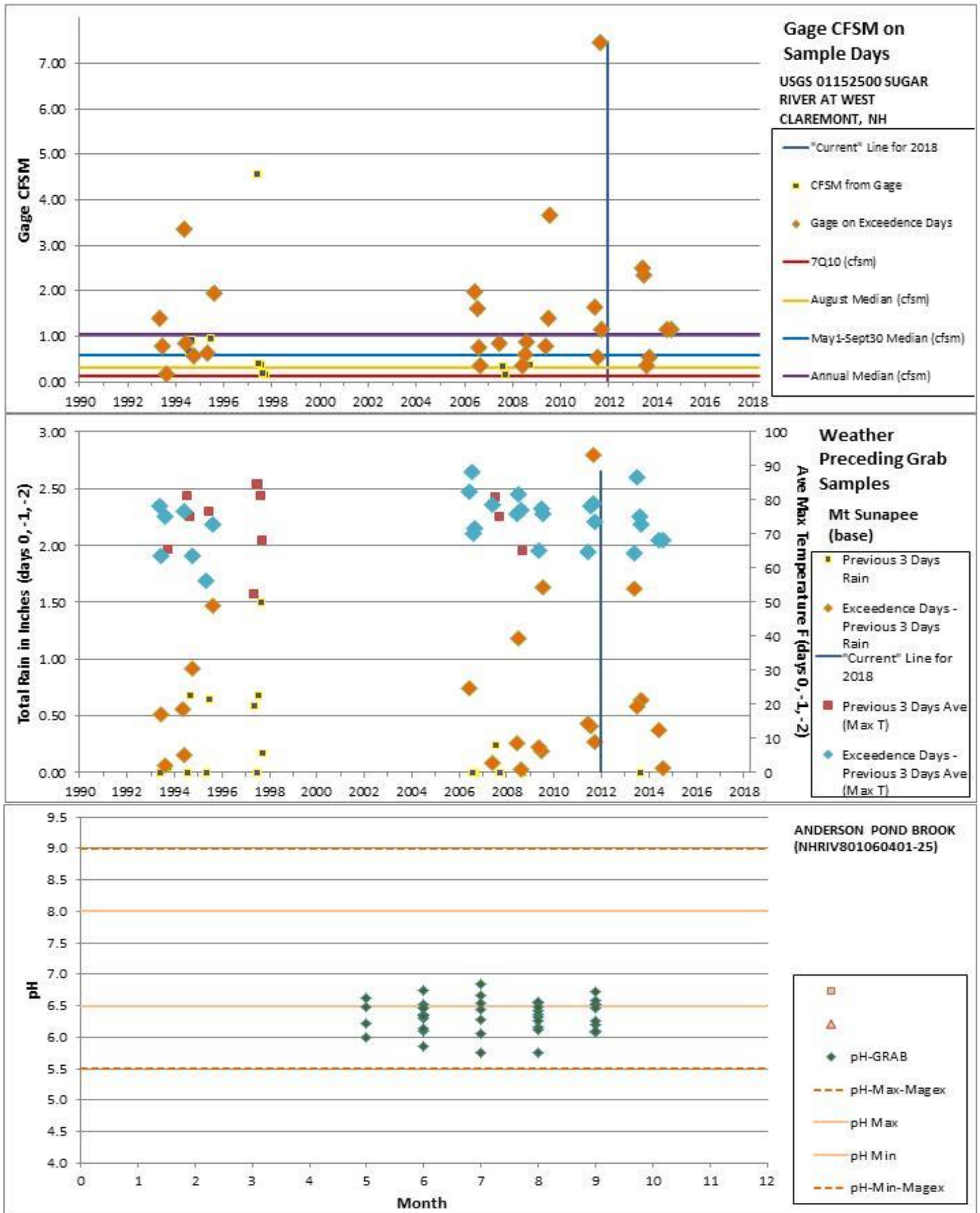
“Current” Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered “current” unless available older data is provided for context. See the 2018 CALM for additional details.

ANDERSON POND BROOK (NHRIV801060401-25)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
ANDERSON POND BROOK	NHRIV801060401-25	pH	GRANTHAM	3-ND	5-M

All of the grab samples (n=6) collected at station EASGTMAPD in June-September of 2013 and 2014 were below the lower pH threshold of 6.5 (pH ranged from 5.76 – 6.37). The samples were taken at flows ranging from 0.37 – 2.51 CFSM at the Sugar River gage (01152500) and in variable weather conditions (0.0 – 1.62 inches previous three-day rain). With this new data, and the historic low pH data, Anderson Pond Brook (NHRIV801060401-25) has been moved from 3-ND to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

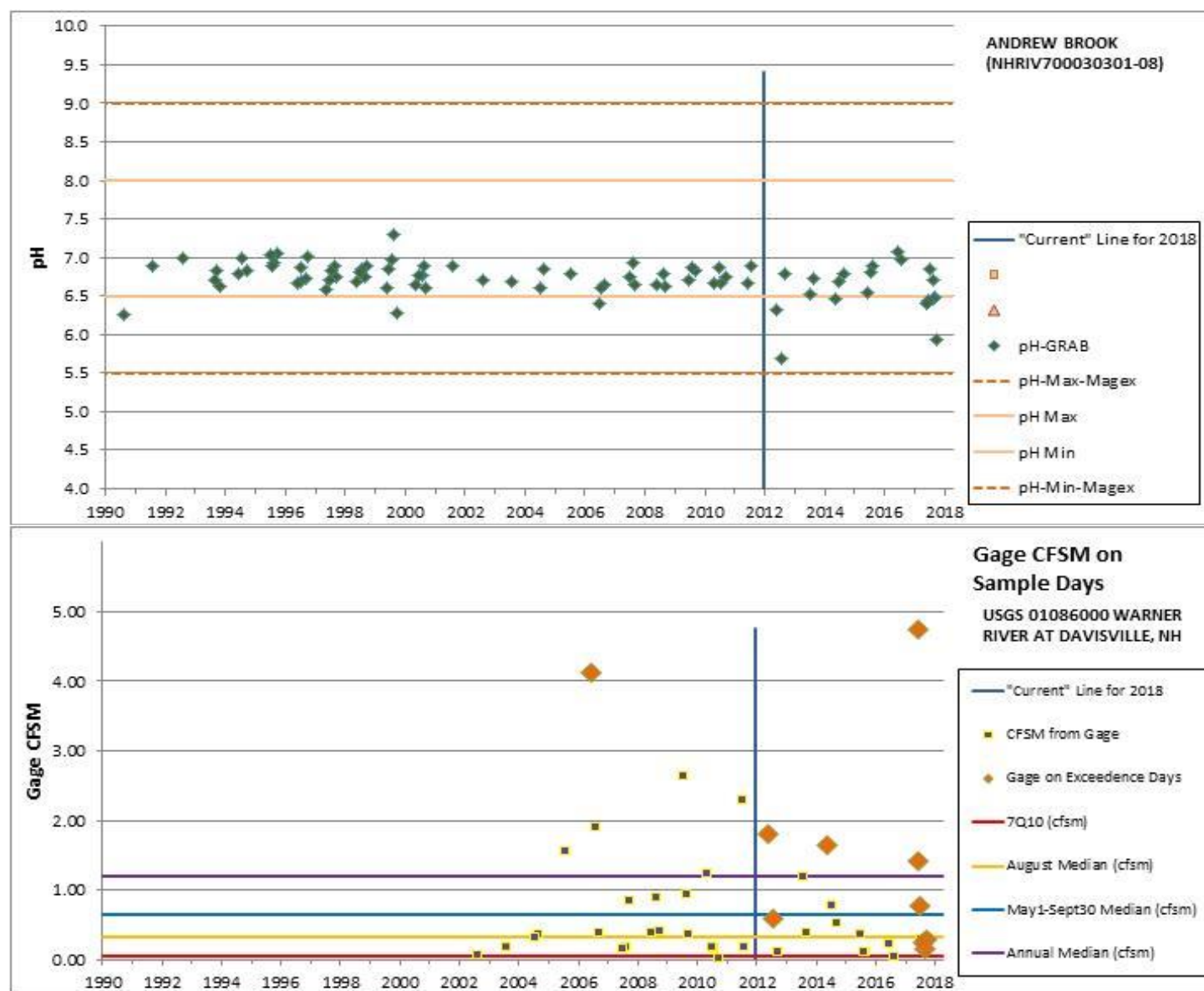
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

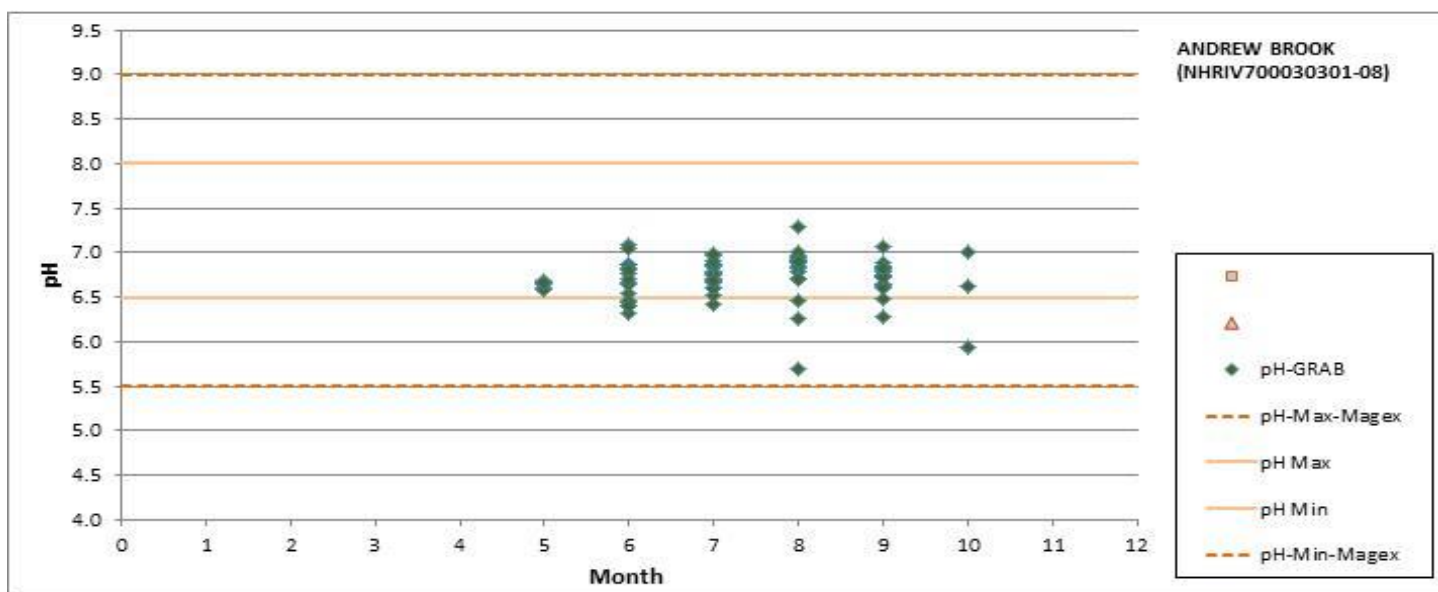
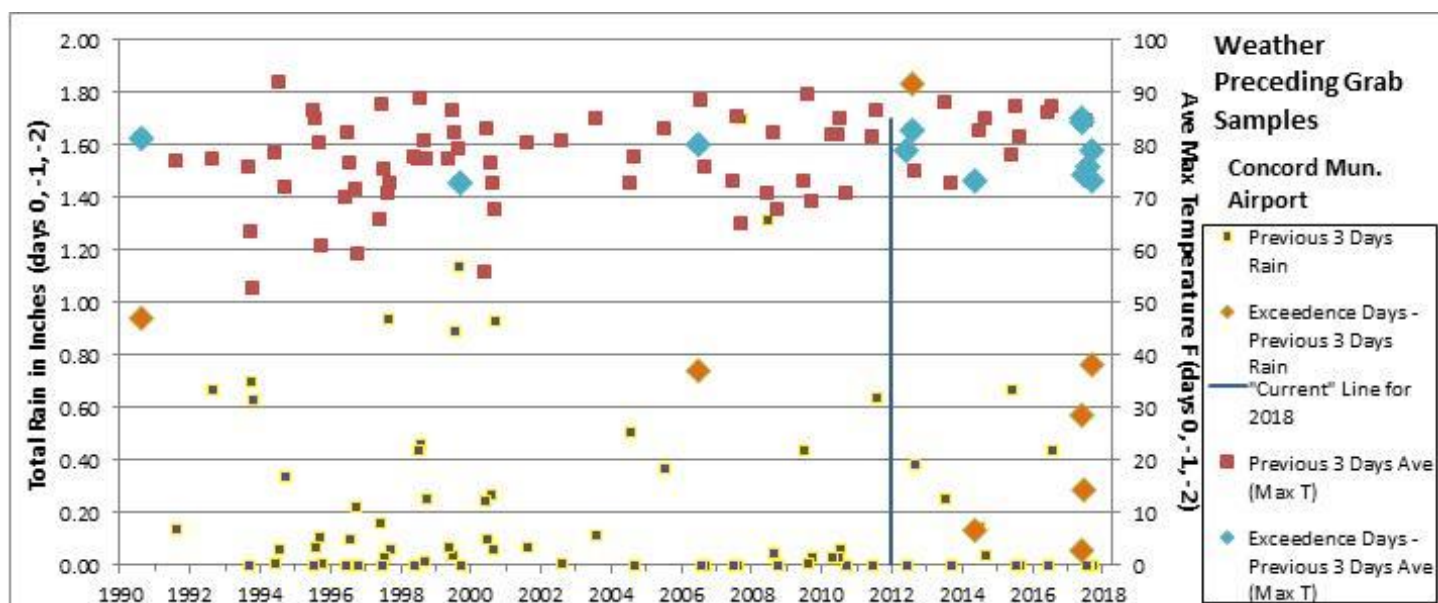
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

ANDREW BROOK (NHRIV700030301-08)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
ANDREW BROOK	NHRIV700030301-08	pH	BRADFORD	3-PNS	5-M

Grab sample data collected in 2012 through 2018 at station TODNBYO triggered the new impairment in the 2018 cycle. Nine of the 21 (42.8%) were below the lower water quality criteria (6.5). The low pH samples were collected between June and October at flows ranging from 0.16 to 4.75 cfs on the Warner River gage (01086000) and various weather conditions (0.00-1.83" preceding three-day precipitation). Andrew Brook (NHRIV700030301-08) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

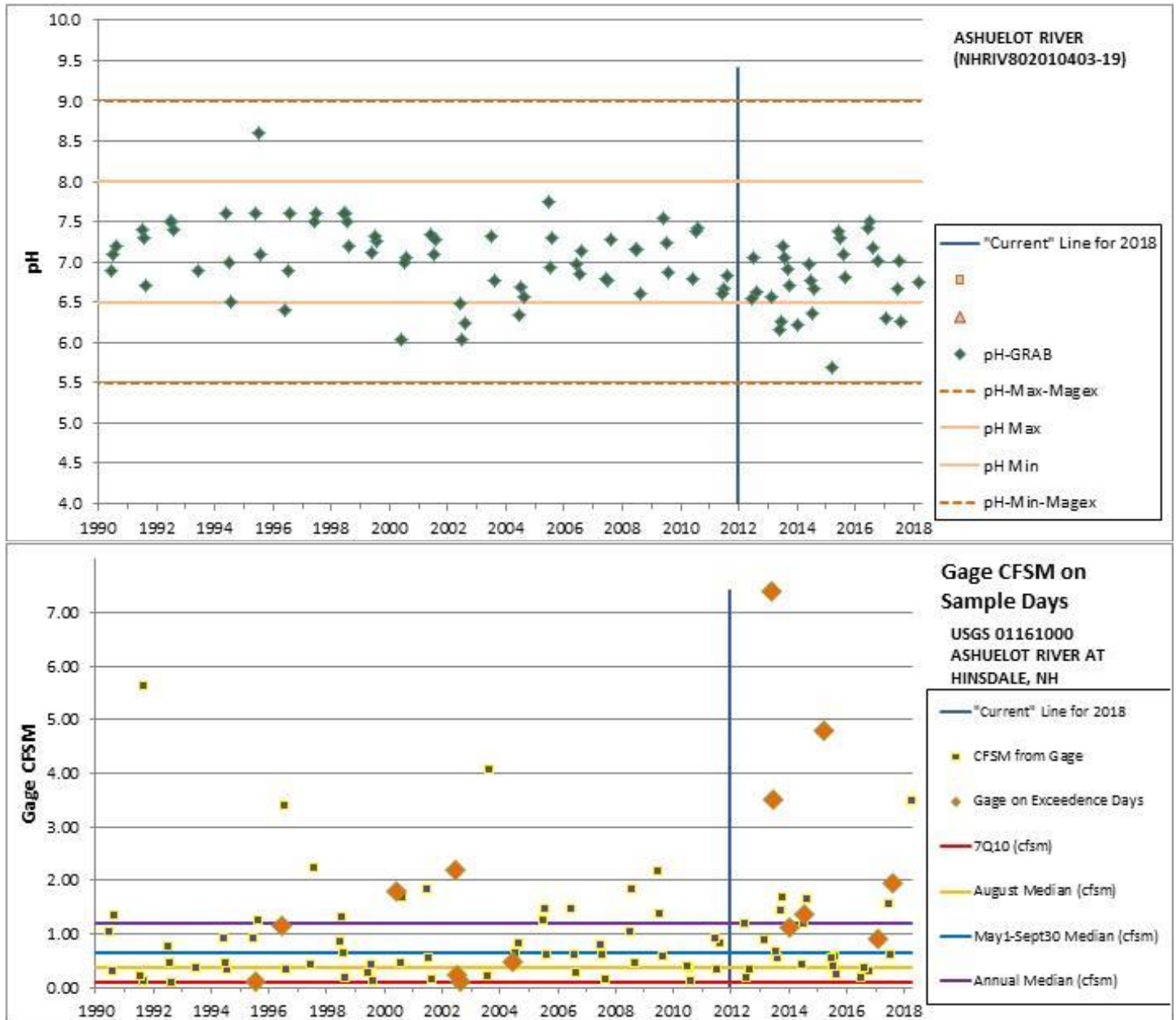
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

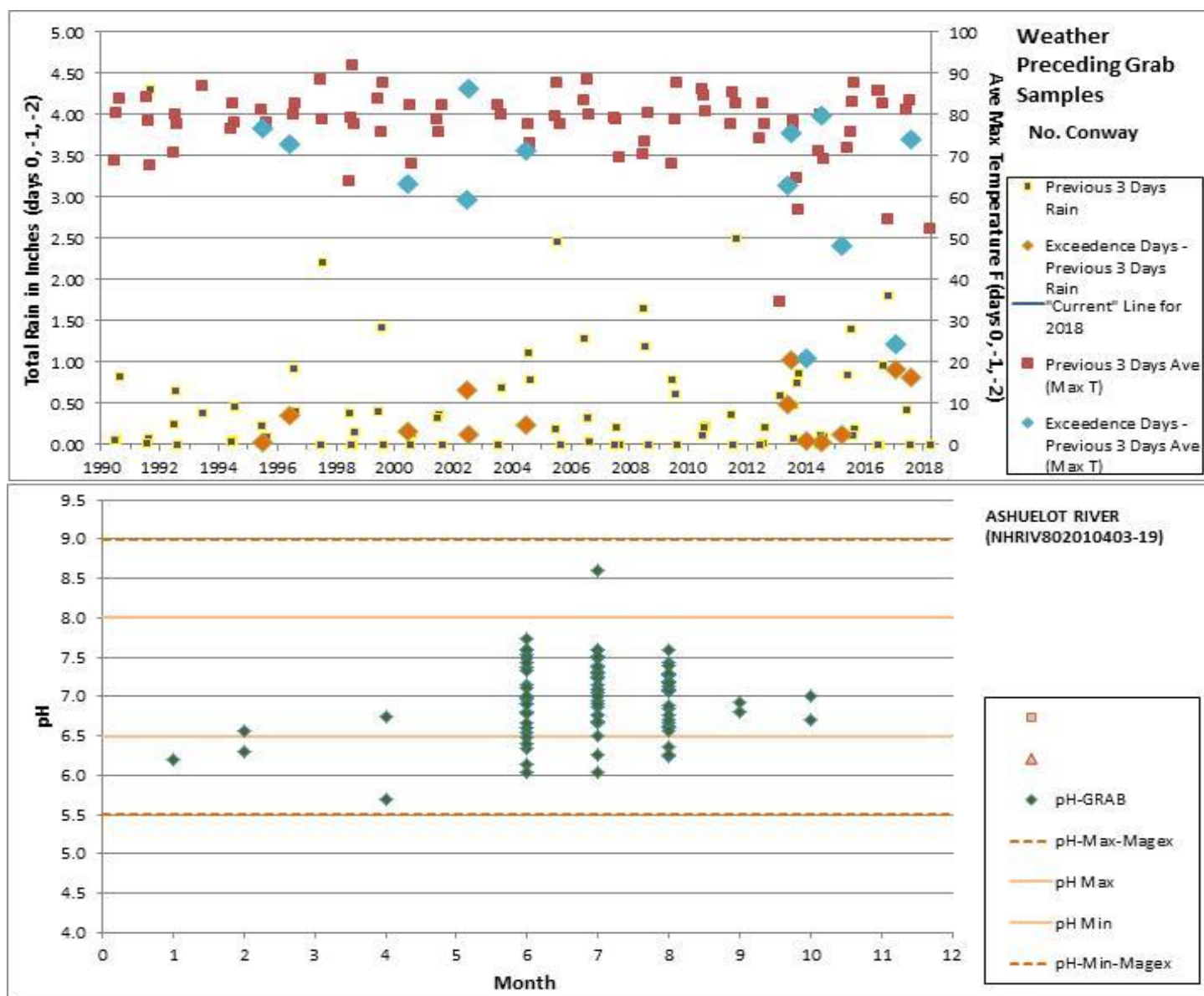
ASHUELOT RIVER (NHRIV802010403-19)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
ASHUELOT RIVER	NHRIV802010403-19	pH	HINSDALE	3-PNS	5-M

Grab samples from station 02-ASH from 1990 to 2018 indicated impairment for the 2018 cycle. Historically, 13 of 92 grab samples (14.1%) were below 6.5 (pH values between 5.69 -6.48) and one grab sample (1.1%) was over 8 (pH value of 8.60). Since 2012, 29 grab samples have been collected, with 7 samples below 6.5 (24.1%; pH values between 5.69 – 6.36). The majority of samples were collected in June, July, and August, with a handful from January, February, April, September and October. These samples were collected at flows between 0.21- 7.4 CFSM on the Ashuelot River gage (01161000) and during varying weather conditions with 0 -2.02 inches preceding three-day precipitation. For samples

that were below 6.5, the flows ranged from 0.9-7.4 CFSM with 0-1.71 inches preceding three-day precipitation. The 2016 assessment cycle suggested that more data be collected before a full assessment decision was made. Additional data have been collected from a range of conditions similar to past grab samples and the percentage of exceedences continues to be well above 10%, therefore the Ashuelot River (NHRIV802010403-19) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

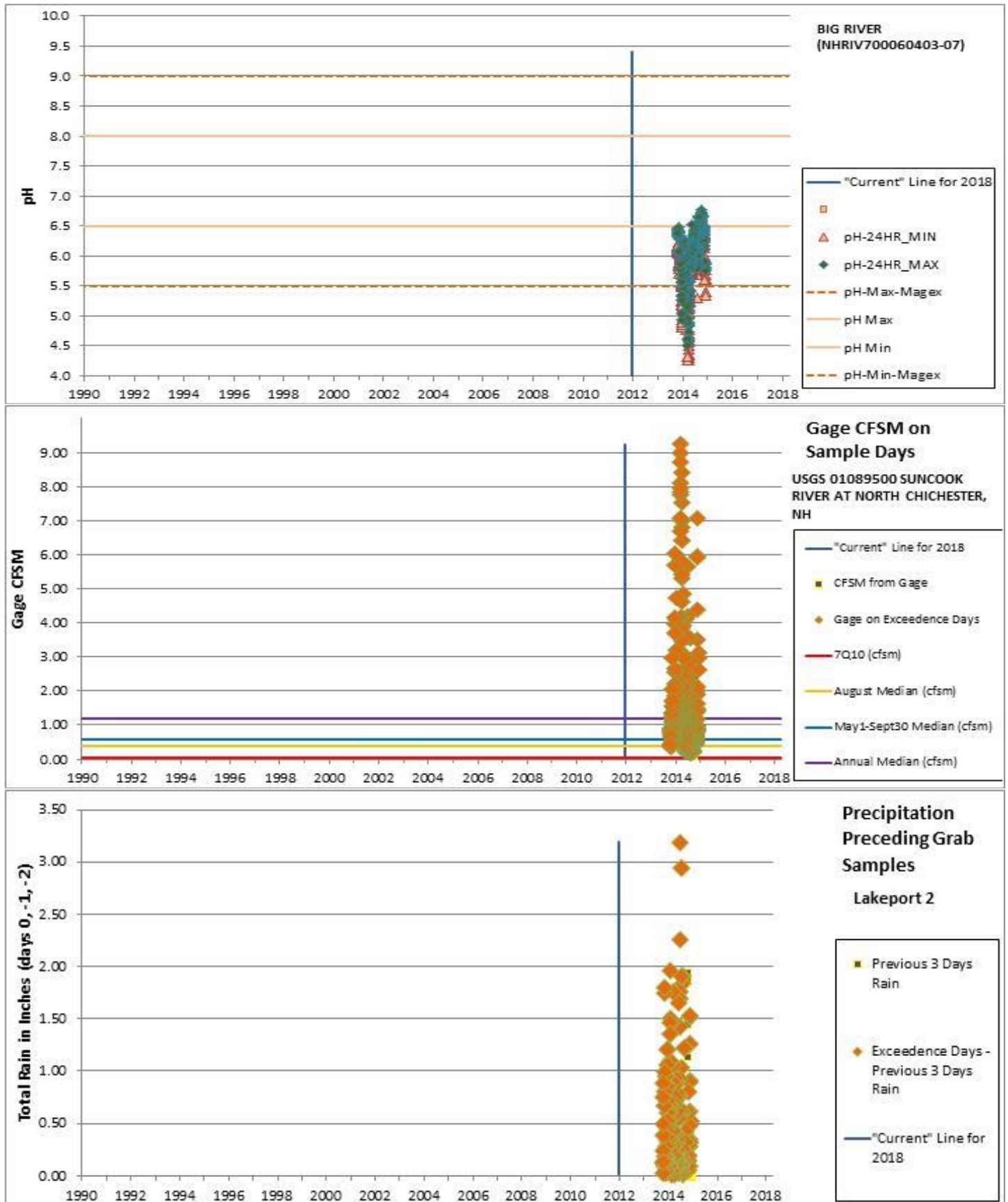
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

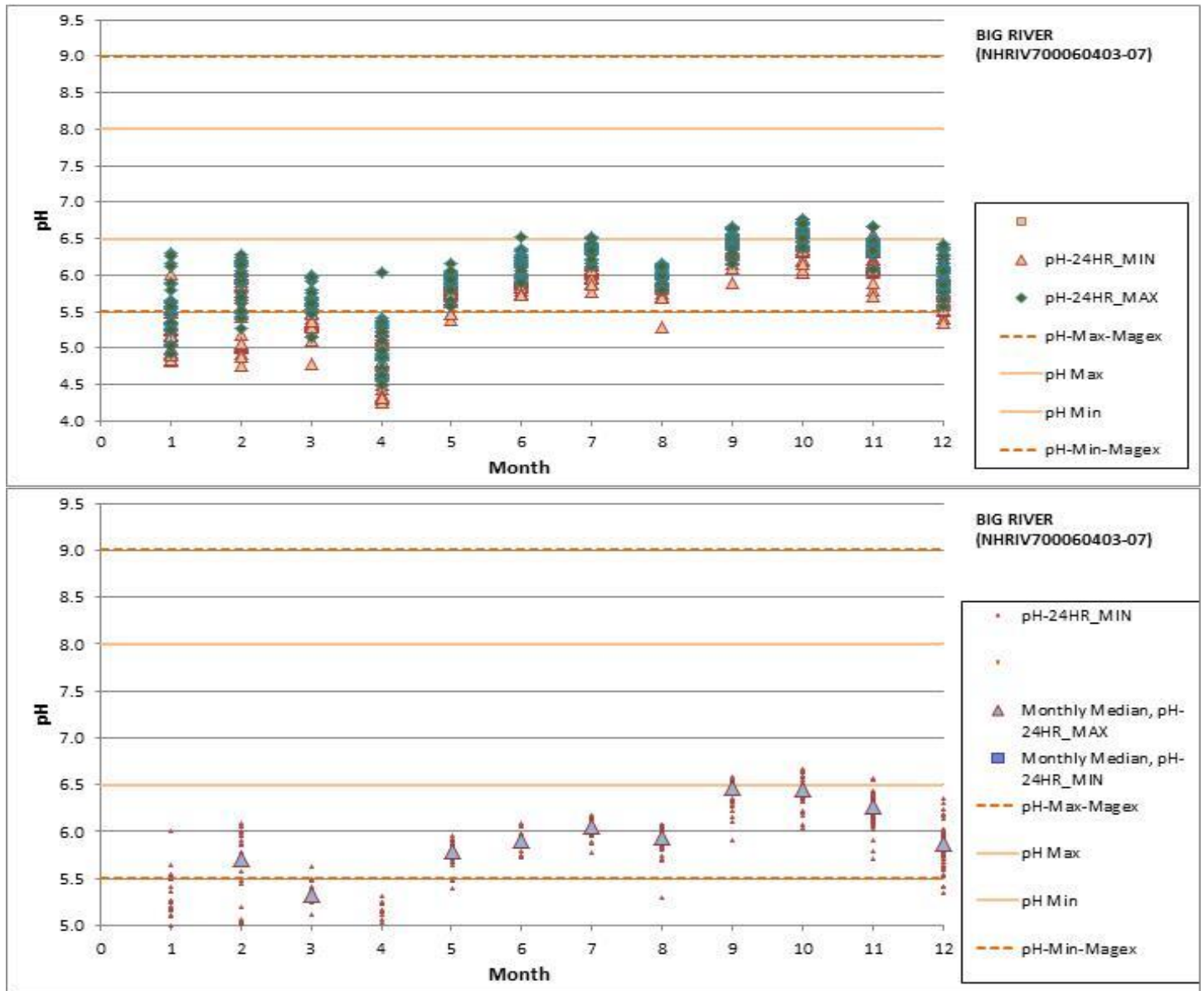
BIG RIVER (NHRIV700060403-07)

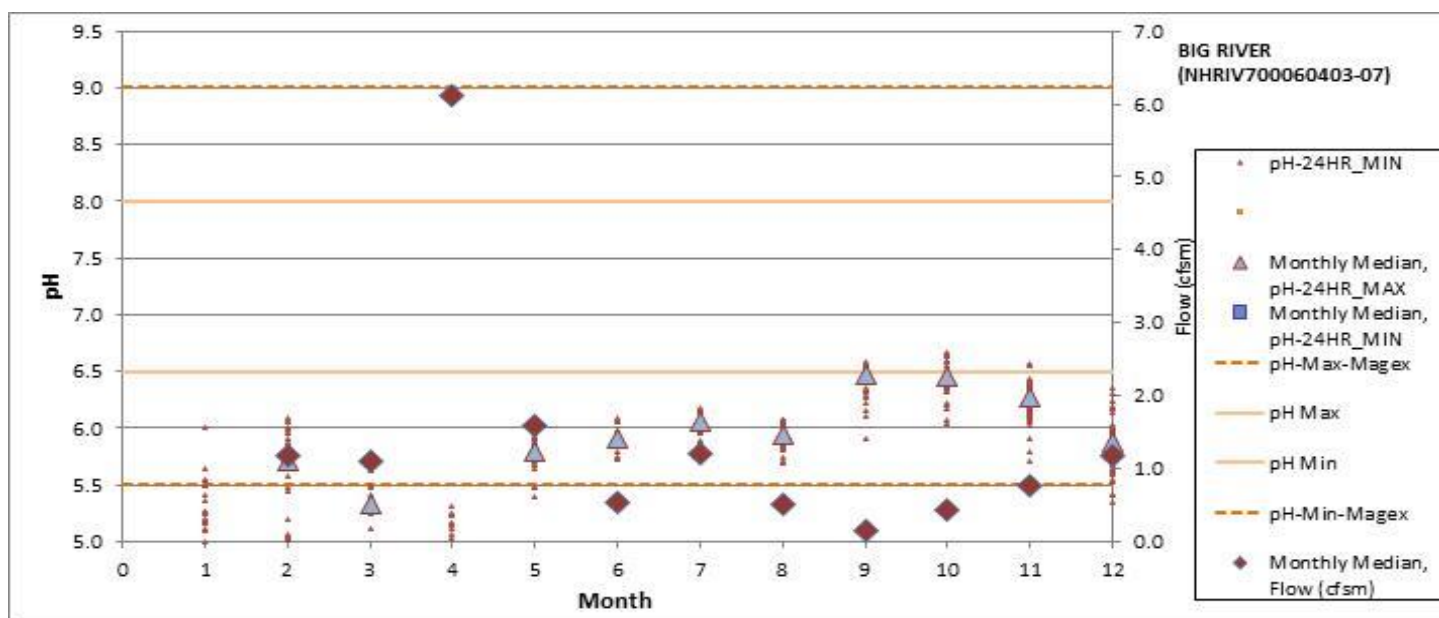
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
BIG RIVER	NHRIV700060403-07	pH	STRAFFORD, BARNSTEAD	3-ND	5-P

Three hundred and eighty-three of the 812 (47.2%) daily maximum and minimum logger values collected from October 30, 2013 to December 17, 2014 were below the lower pH threshold of 6.5. The low pH values were collected at flows ranging from 0.09 to 9.24 cfs on the Suncook River gage (01089500) and varying weather conditions (0.00-3.19 inches preceding 3-day precipitation). The Big River (NHRIV700060403-07) has been moved from 3-ND to 5-P for pH for the aquatic life integrity designated use based on data collected in the current assessment period.



Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters





Notes:

pH-24HR_MIN = pH minimum value from a datalogger deployment.

pH-24HR_MAX = pH maximum value from a datalogger deployment.

pH-GRAB = pH value from a grab sample.

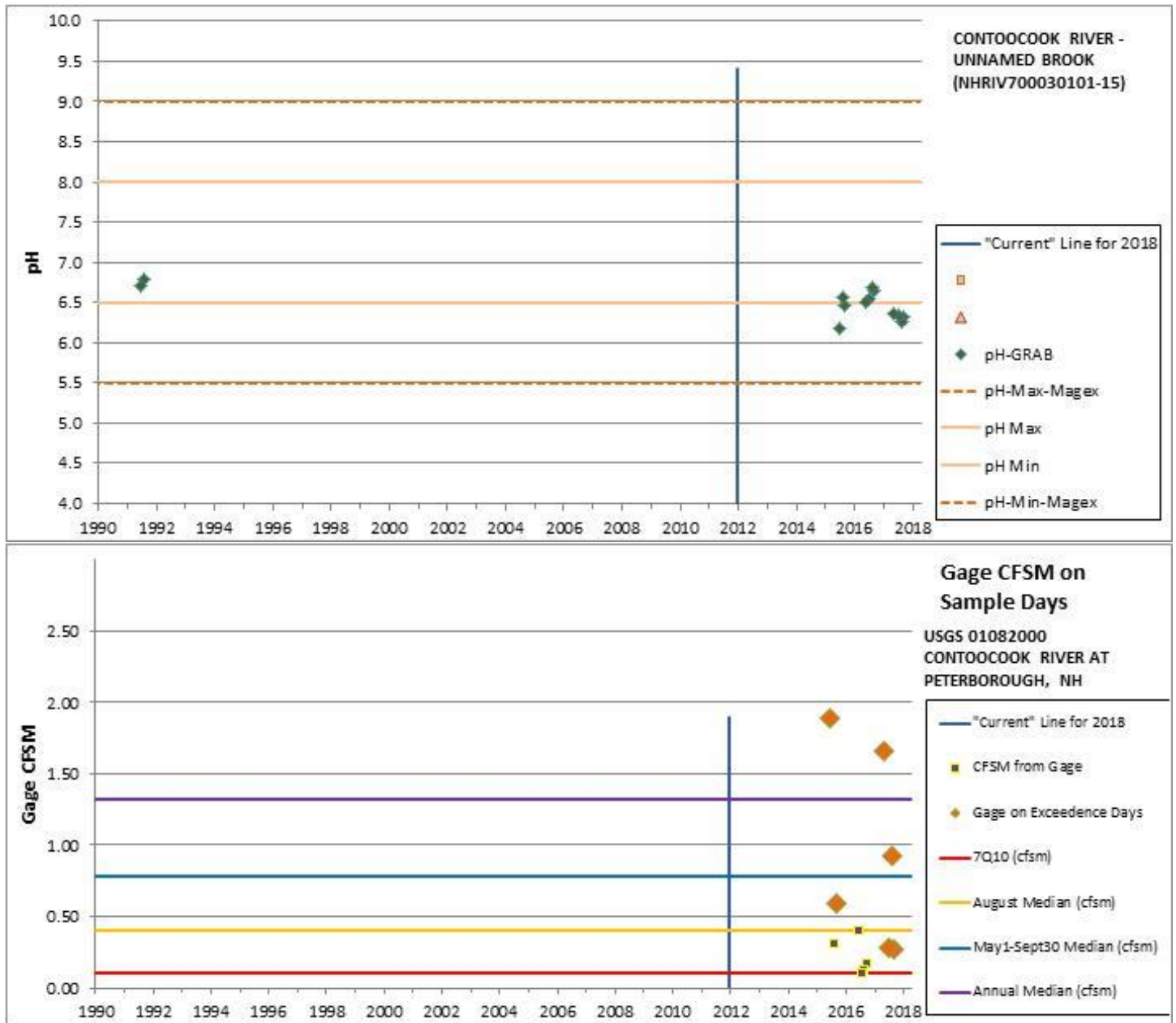
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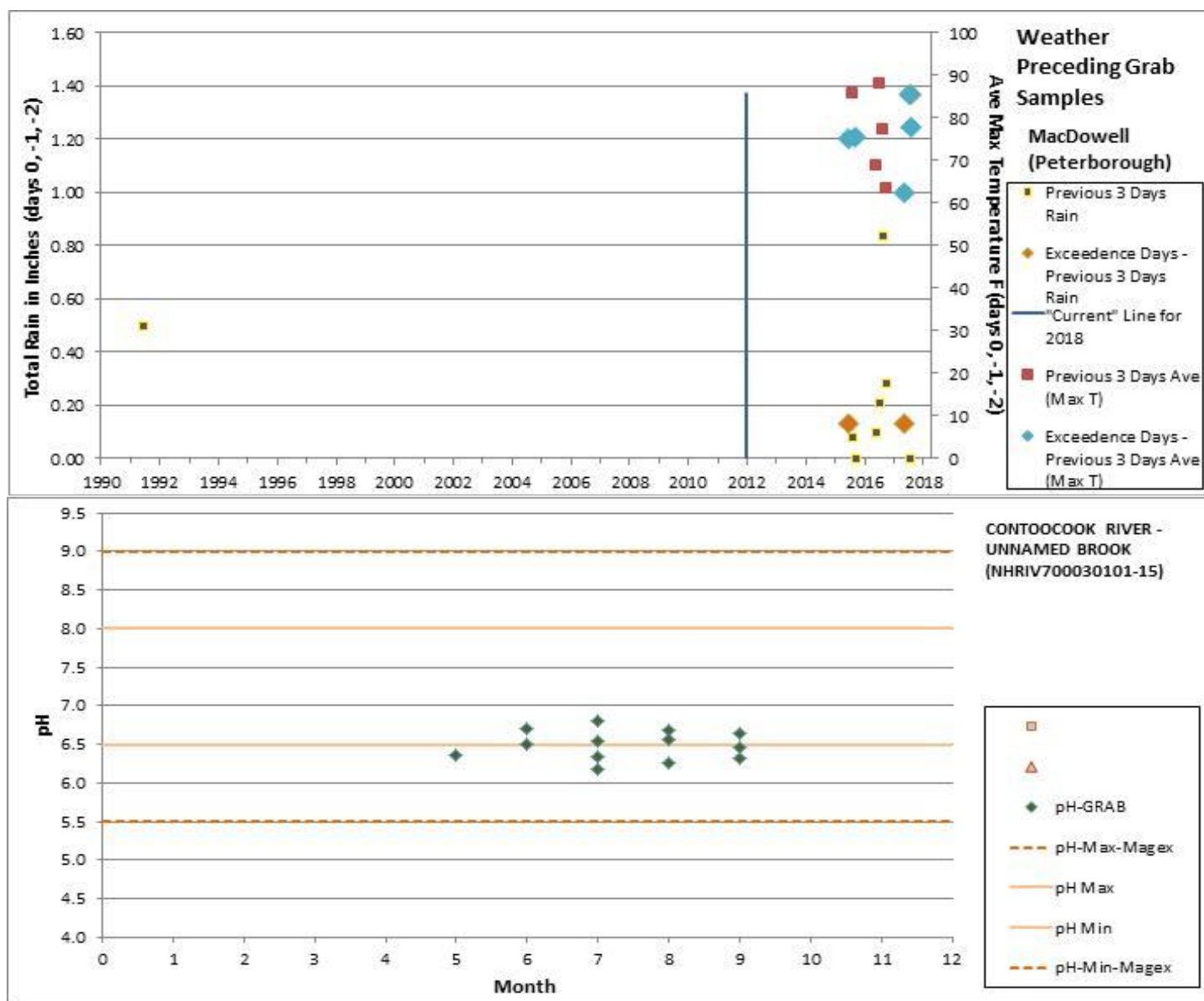
“Current” Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered “current” unless available older data is provided for context. See the 2018 CALM for additional details.

CONTOOCCOOK RIVER - UNNAMED BROOK (NHRIV700030101-15)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
CONTOOCCOOK RIVER - UNNAMED BROOK	NHRIV700030101-15	pH	JAFFREY	3-ND	5-M

Six out of the eleven (54.5%) grab sample data collected at station 32T-CTC were below the lower water quality criteria (6.5). The low pH samples were collected between May and September at flows ranging from 0.28 to 1.89 cfs on the Contoocook River gage (01082000) and during varying weather conditions (0.00-1.66 inches preceding three-day precipitation). The Contoocook River (NHRIV700030101-15) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

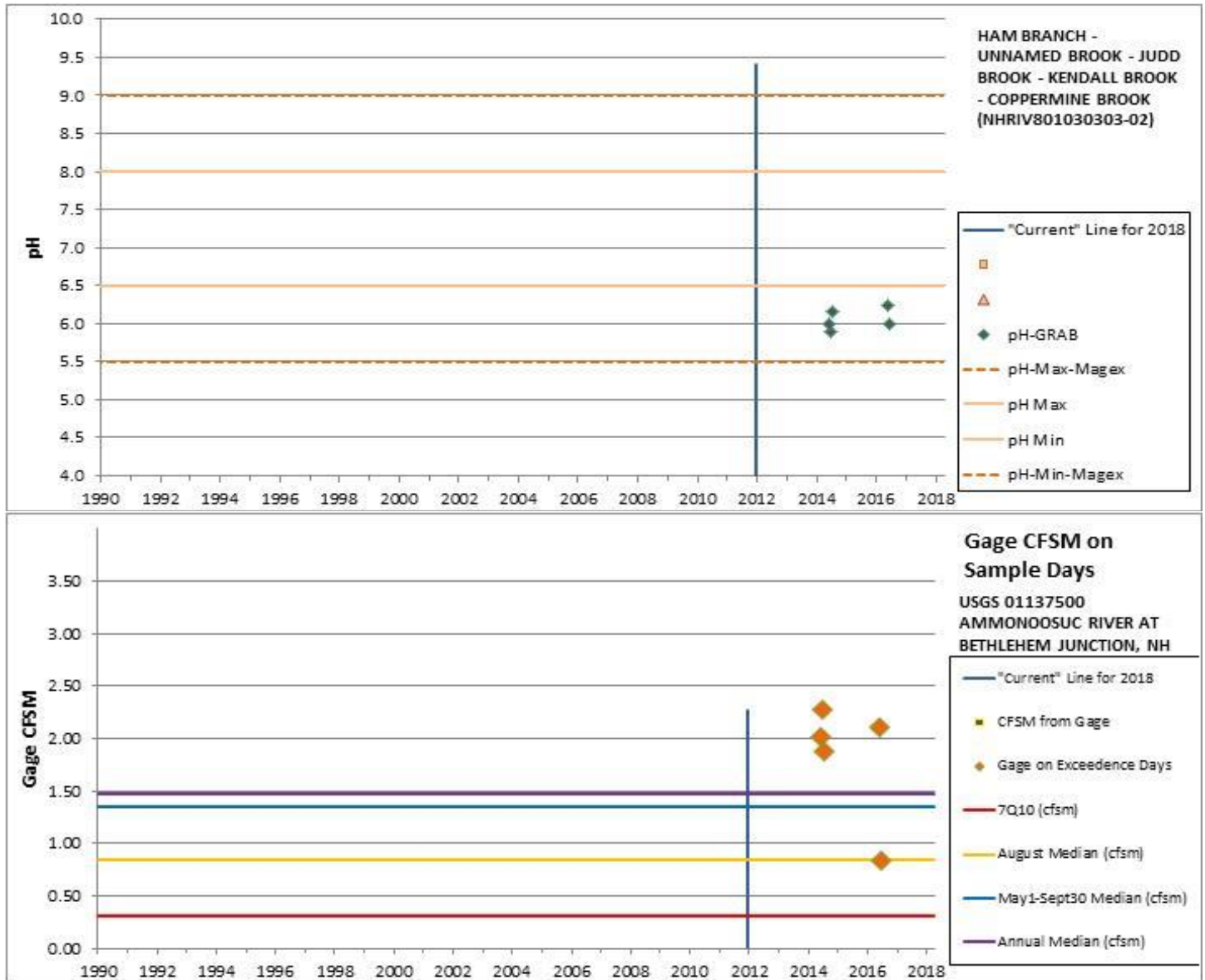
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

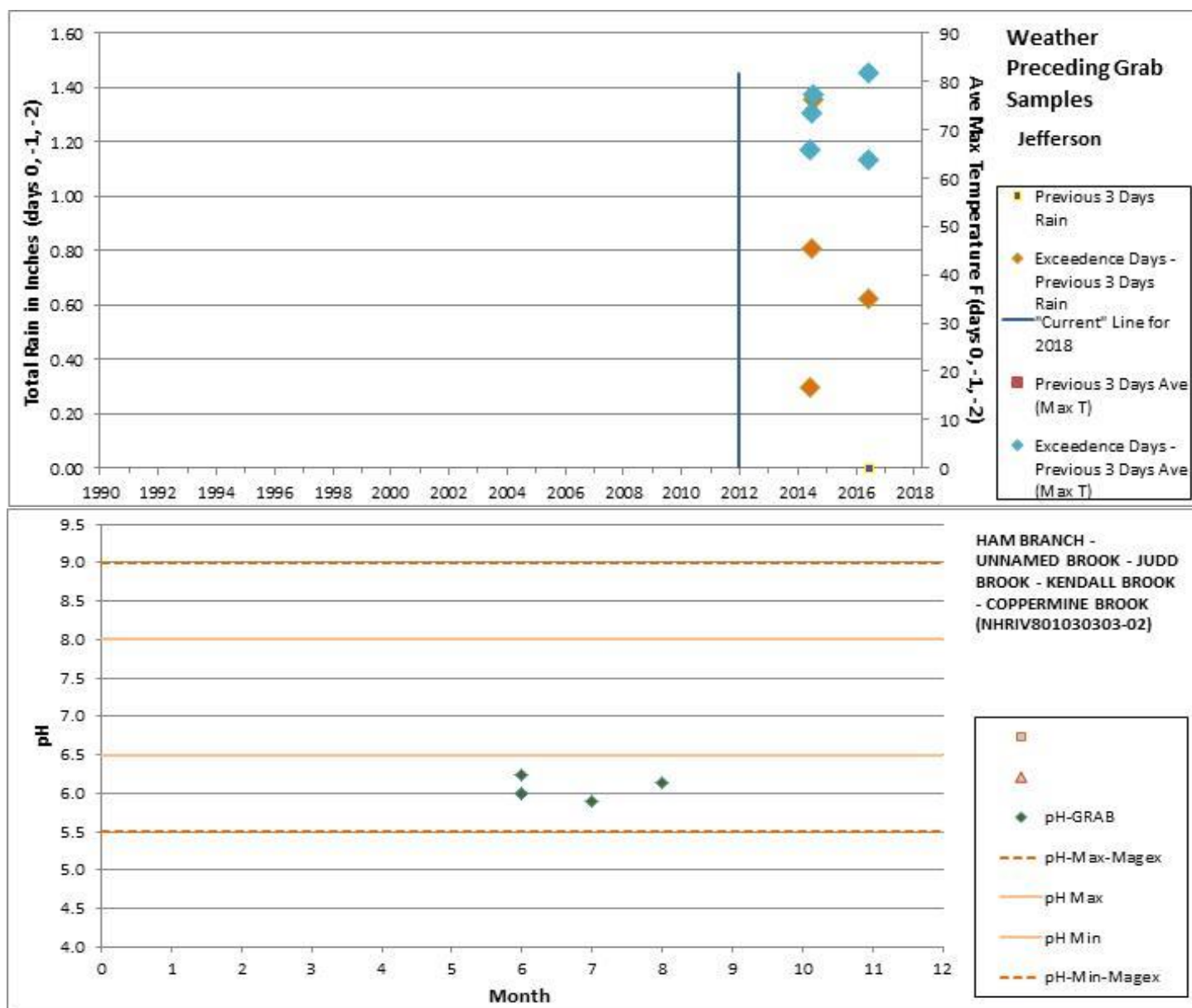
HAM BRANCH - UNNAMED BROOK - JUDD BROOK - KENDALL BROOK - COPPERMINE BROOK (NHRIV801030303-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
HAM BRANCH - UNNAMED BROOK - JUDD BROOK - KENDALL BROOK - COPPERMINE BROOK	NHRIV801030303-02	pH	EASTON, FRANCONIA, SUGAR HILL	3-PNS	5-M

All of the grab samples (n=6) collected at stations 13-HAM and 07-HAM were below the minimum pH threshold of 6.5 (pH values ranged from 5.89 – 6.24). These samples were collected in 2014 and 2016 under flow conditions ranging from 0.84 – 2.27 CFSM at the Ammonoosuc River at Bethlehem Junction gage (01137500) and under variable weather

conditions (0.0 - 1.36 inches previous three-day precipitation). During the 2016 assessment cycle, more samples were requested before a full assessment decision could be made. Additional sampling was conducted in 2016, finding that the sites pH values were below the threshold in more than one year. Ham Branch - Unnamed Brook - Judd Brook - Kendall Brook - Coppermine Brook (NHRIV801030303-02) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

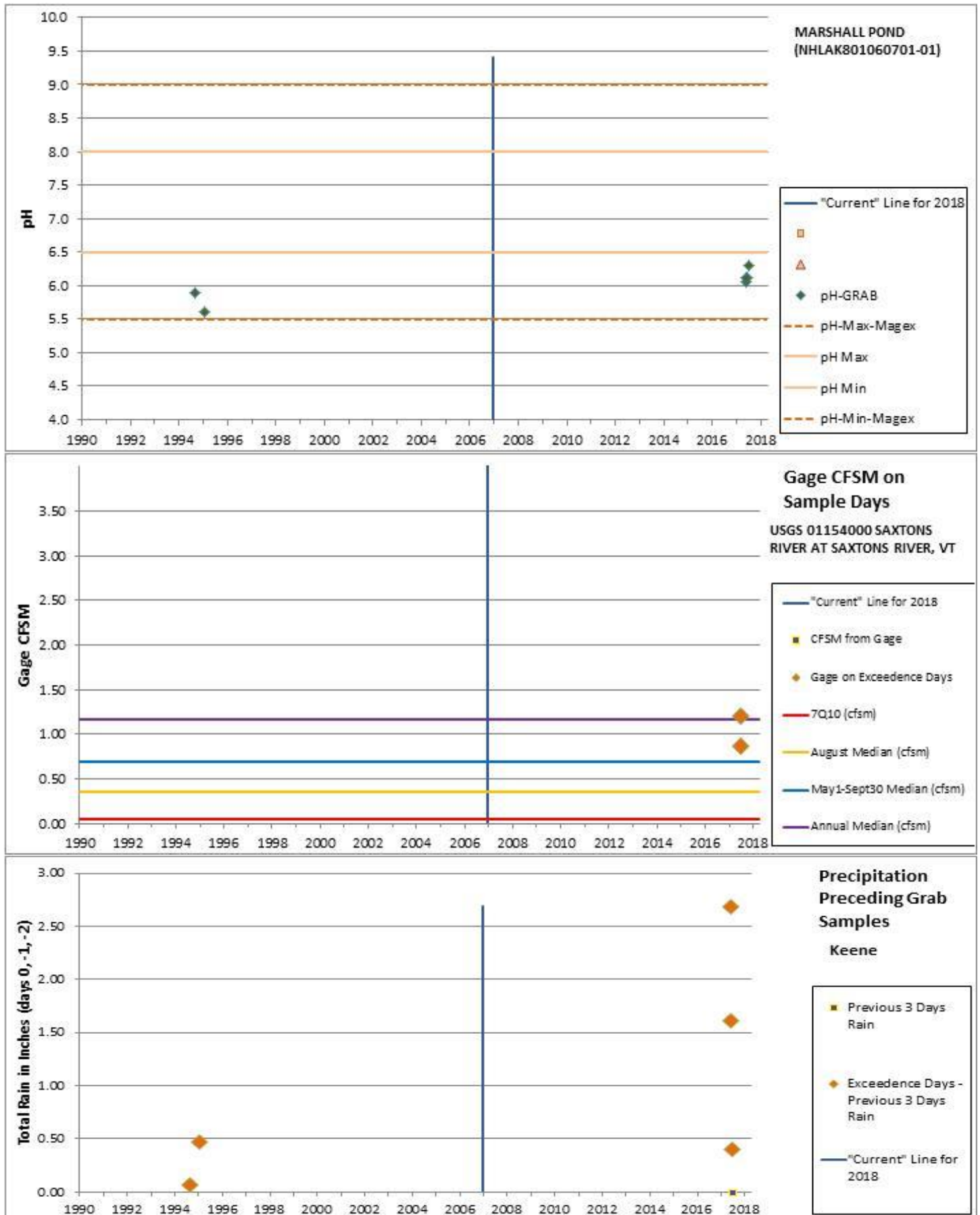
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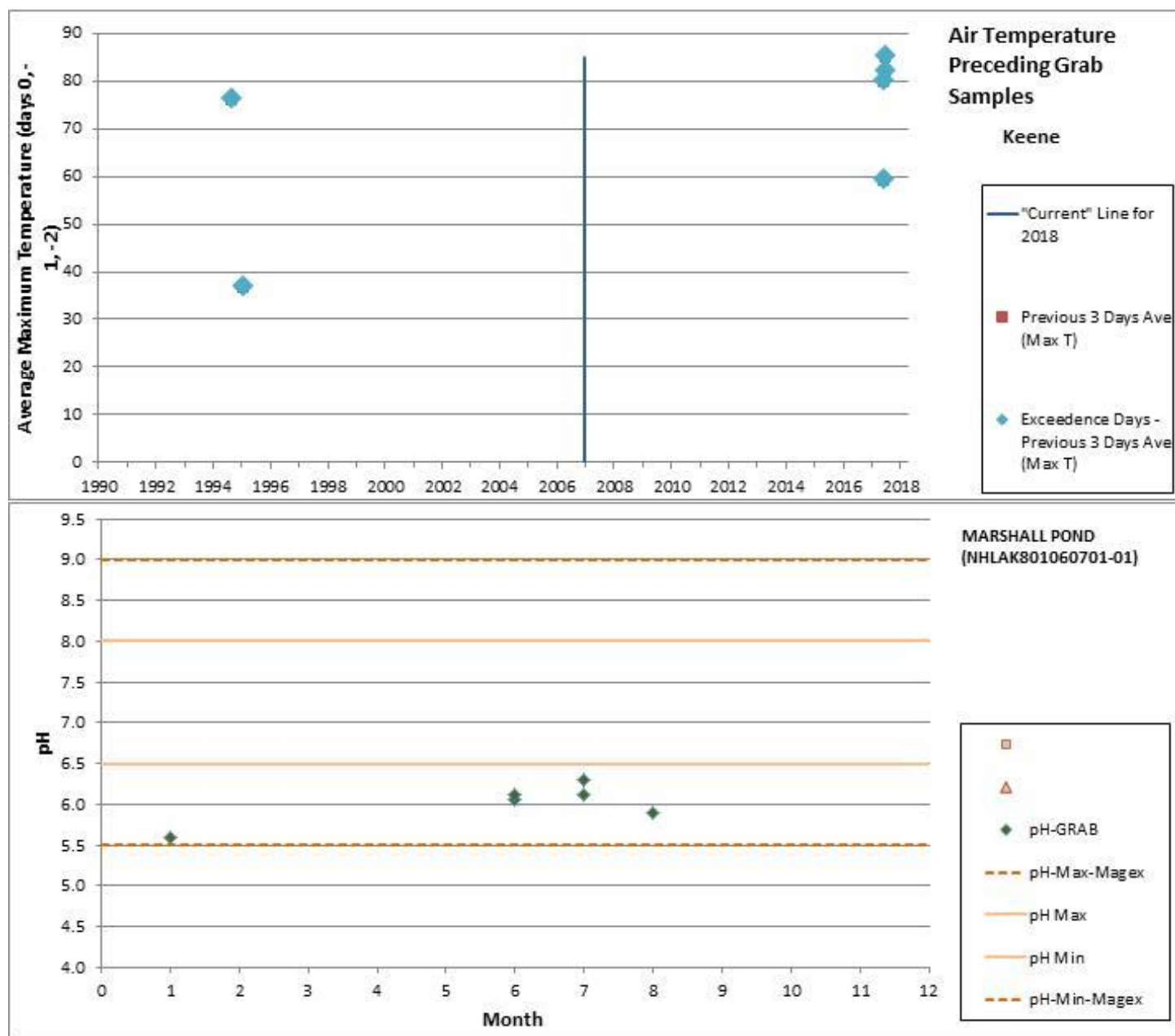
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

MARSHALL POND (NHLAK801060701-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
MARSHALL POND	NHLAK801060701-01	pH	UNITY	3-ND	5-M

All the grab samples (n=4) collected were below the lower pH threshold of 6.5, which resulted in a new impairment in the current assessment period (2008-2018). The pH samples were collected at flows between 0.86 cfs and 15.93 cfs on the Saxtons River gage (01154000) and during weather conditions with three-day rainfall totals between 0.00 inches and 2.69 inches in June and July. Marshall Pond (NHLAK801060701-01) has been moved from a 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

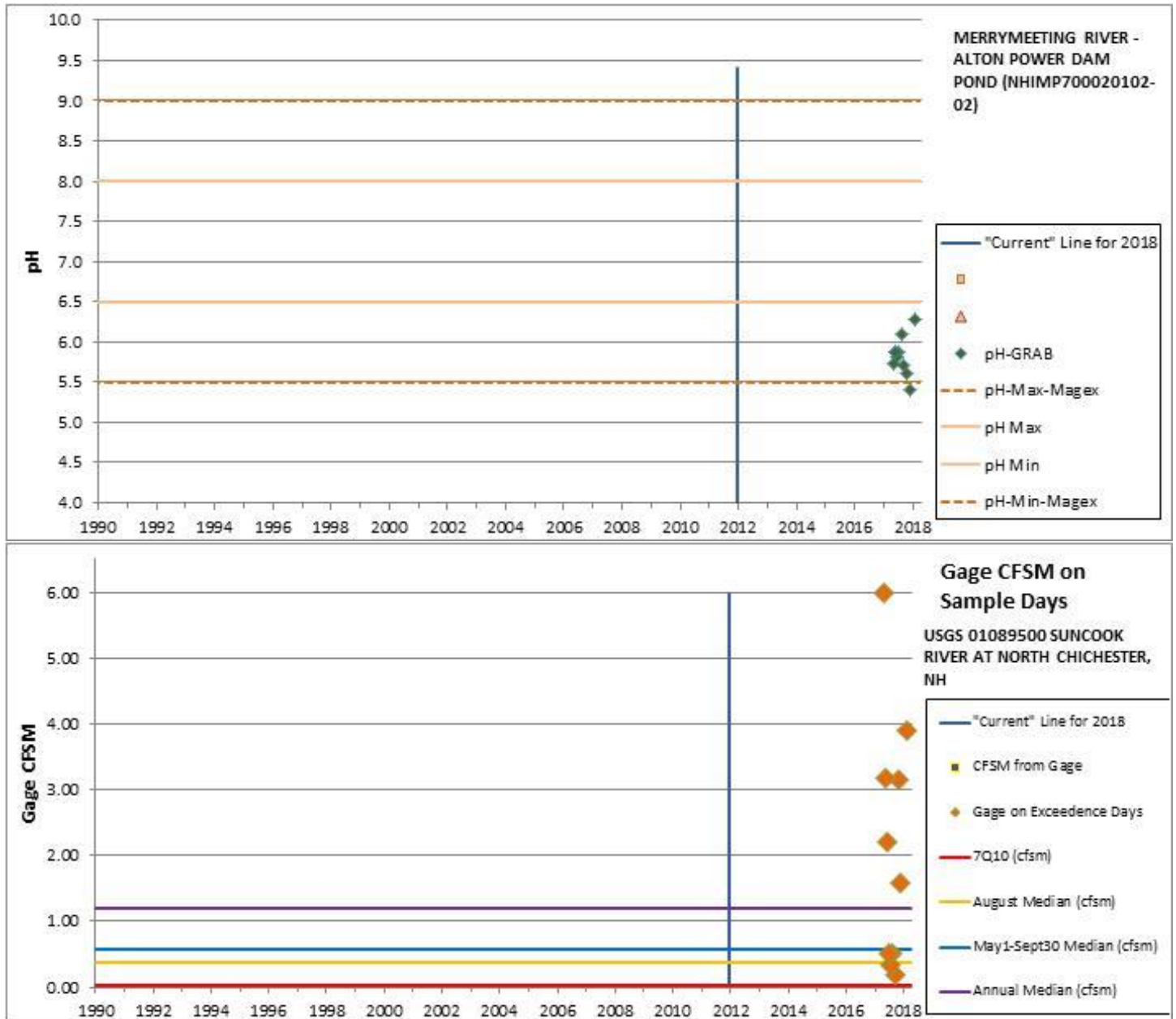
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

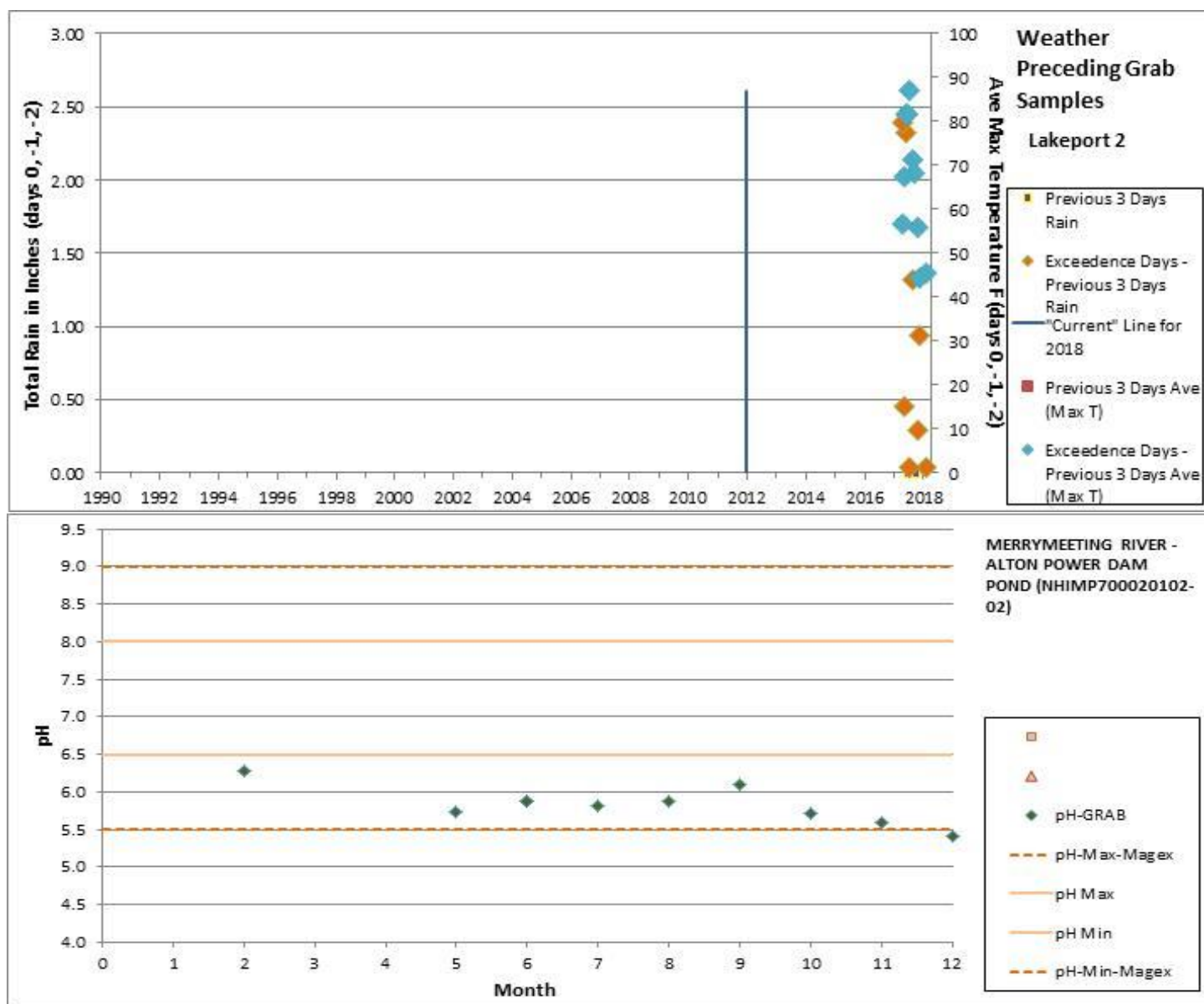
MERRYMEETING RIVER - ALTON POWER DAM POND (NHIMP700020102-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
MERRYMEETING RIVER - ALTON POWER DAM POND	NHIMP700020102-02	pH	Alton	3-ND	5-M

All of the grab samples (n=10) collected in the current assessment period (2012-2018) were below the lower pH criteria (6.5). The pH samples were collected under a wide variety of flow conditions (0.19 – 5.98 cfs) on the Suncook River (01089500) and under a variety of weather conditions (three-day rainfall total of 0.0 – 2.39 inches). The current samples,

(and pH impaired upstream sources) show this to be unlikely. Therefore, Merrymeeting River - Alton Power Dam Pond (NHIMP700020102-02) will change from 3-ND to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

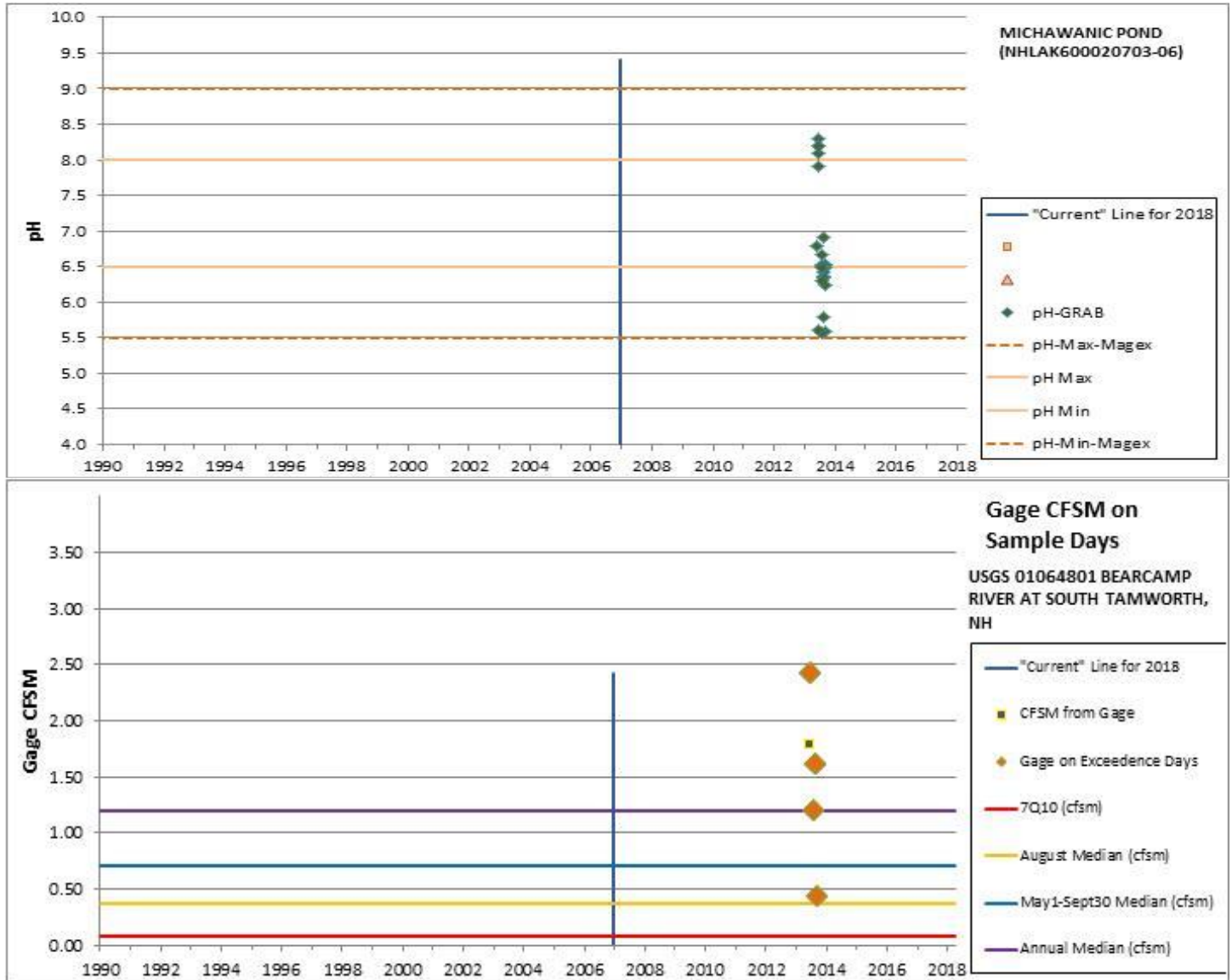
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

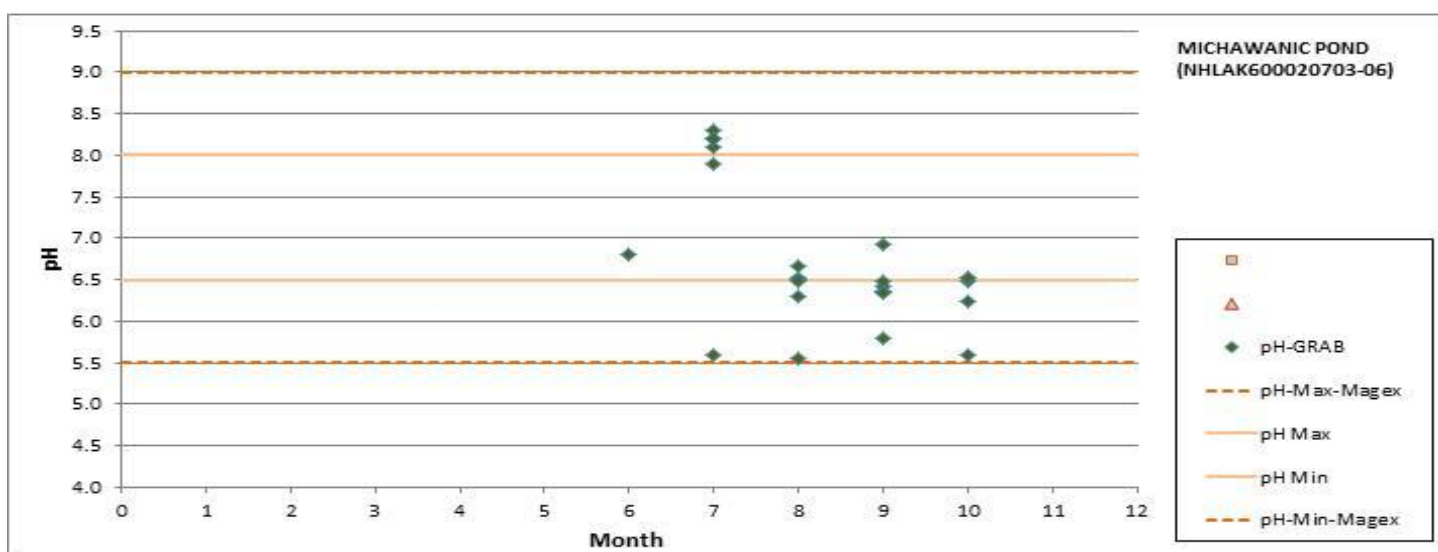
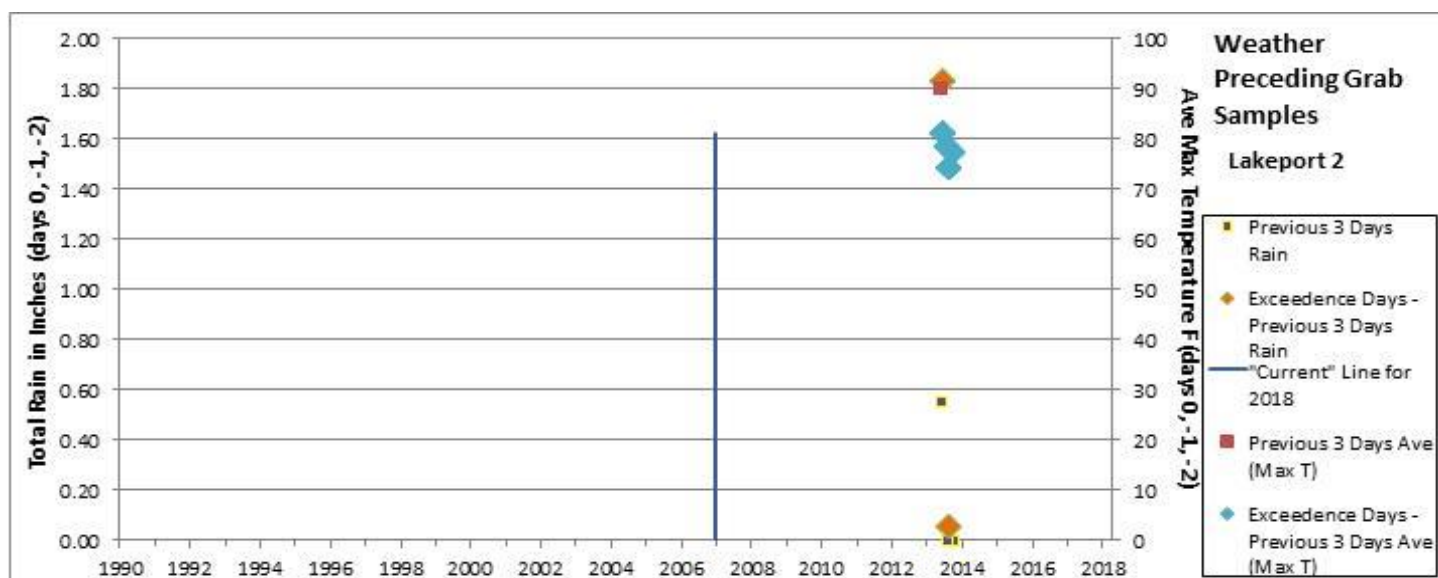
MICHAWANIC POND (NHLAK600020703-06)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
MICHAWANIC POND	NHLAK600020703-06	pH	WAKEFIELD	3-PNS	5-M

12 of the 24 (50%) grab samples collected were below the lower pH threshold of 6.5, and four of the 24 (16%) samples were above the upper pH threshold of 8.0, which resulted in a new impairment in the current assessment period (2008-2018). There were six stations sampled around the lake each being sampled four or five times. The pH values exhibited a very wide range from 5.56 to 8.30 and all the samples were taken in 2013. This is unusual, all of the pH samples over 8.0 were taken during the highest flow rate and highest rainfall of the sampling timeframe, showing there may be outside influences during high flows and wet weather events. However, the lakes deep spot station (the most representative of

the whole lake) had 5 samples taken with four of the five (80%) falling below the lower threshold of 6.5. This demonstrates that although wet weather events have an impact on areas around the lake, overall it does not affect the lake as a whole to any large degree. The pH samples were collected at flows between 0.44 cfs and 2.43 cfs on the Bearcamp River gage (01064801) and during weather conditions with three-day rainfall totals between 0.00 inches and 1.83 inches. The samples were collected between July and October. Michawanic Pond (NHLAK600020703-06) has been moved from a 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.




Notes:

pH-GRAB = pH value from a grab sample.

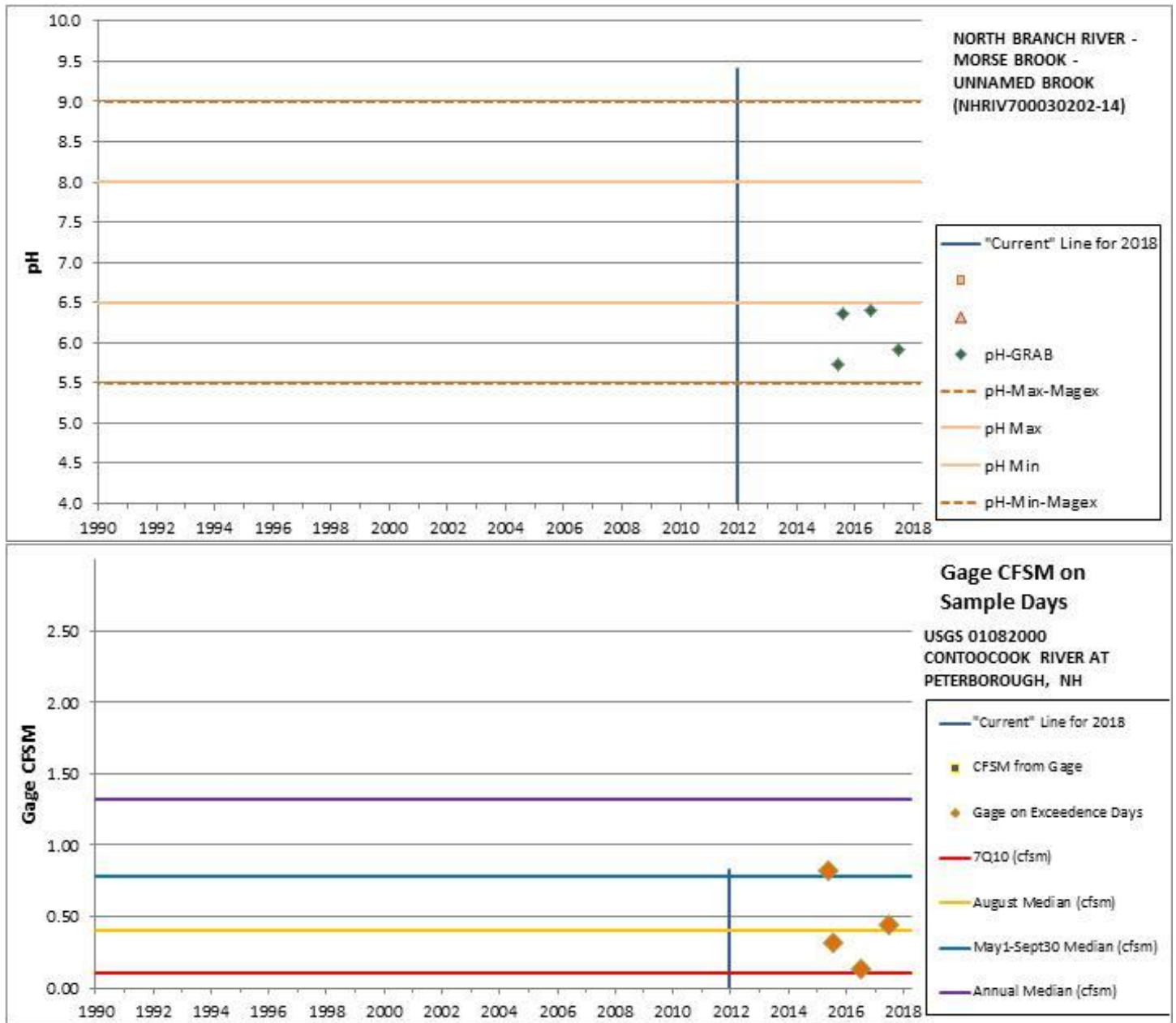
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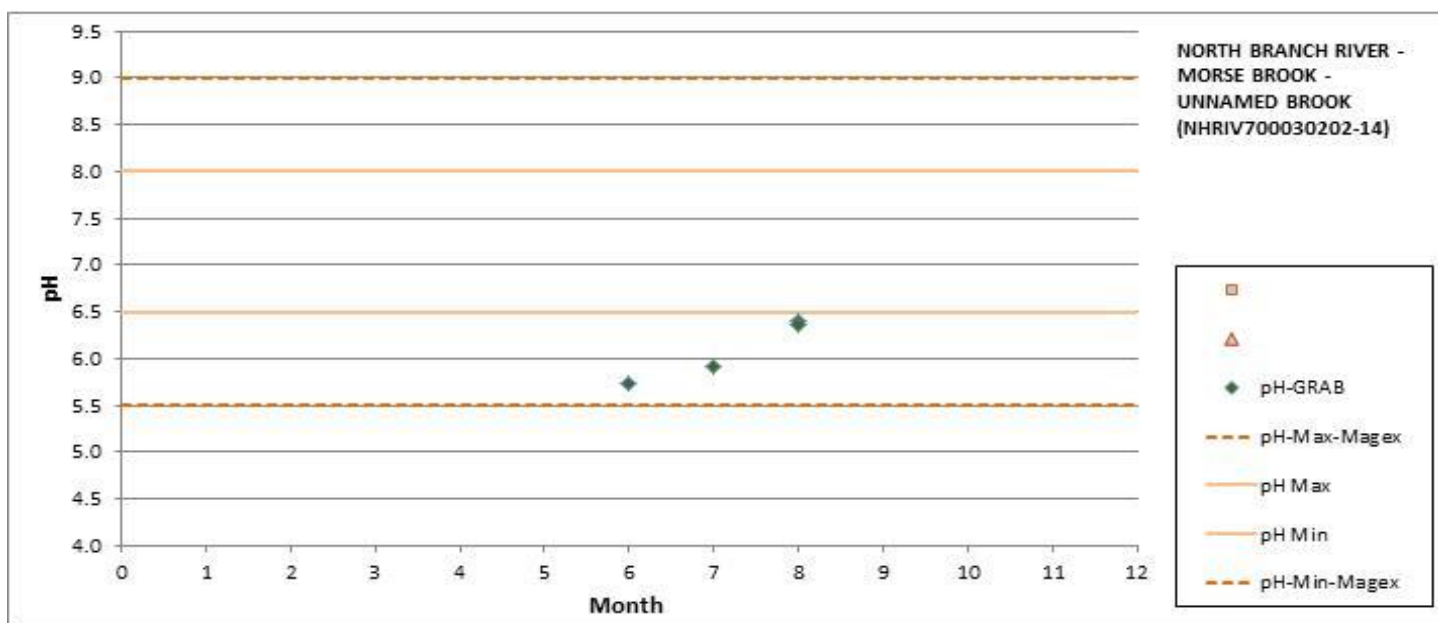
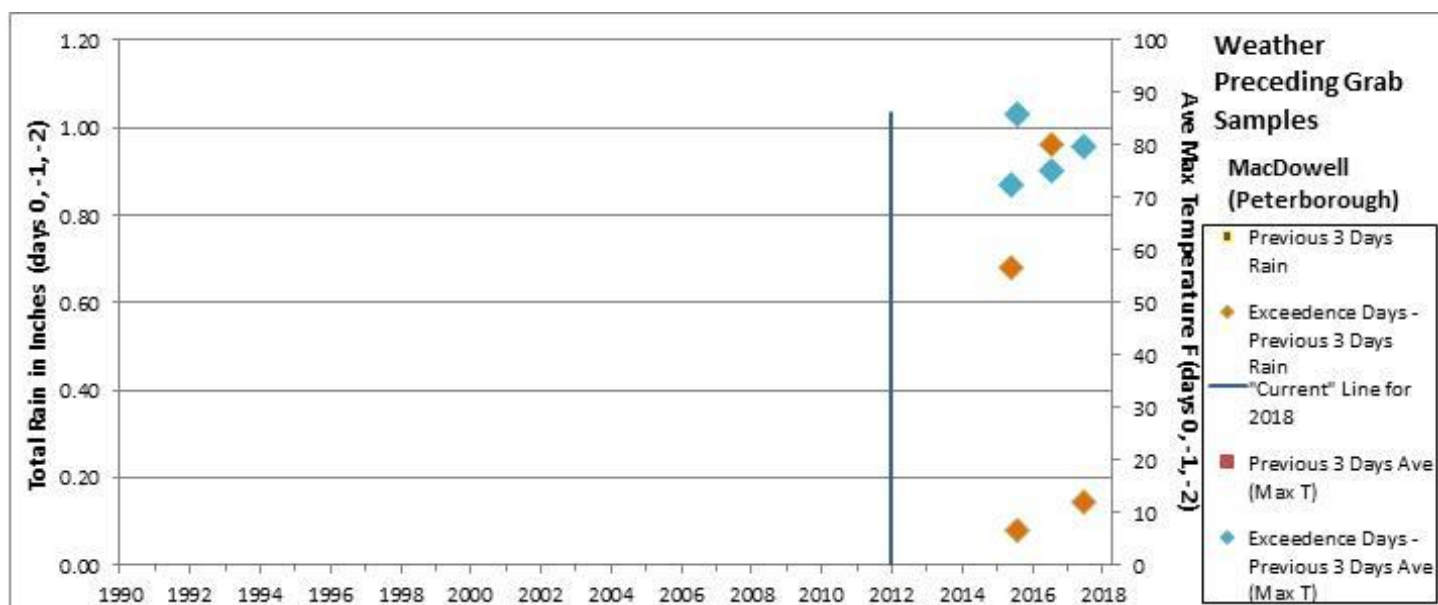
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

NORTH BRANCH RIVER - MORSE BROOK - UNNAMED BROOK (NHRIV700030202-14)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
NORTH BRANCH RIVER - MORSE BROOK - UNNAMED BROOK	NHRIV700030202-14	pH	STODDARD, ANTRIM	3-PNS	5-M

Grab sample data collected in 2015, 2016, and 2017 at station 06-NBC (5.74-6.40) triggered the new impairment in the 2018 cycle. All of the grab samples (n= 4) were below the lower water quality criteria (6.5). The low pH samples were collected between June and August at flows ranging from 0.14 to 0.82 cfs on the Contoocook River gage (01082000) and during varying weather conditions (0.08-0.96 inches preceding three-day precipitation). The North Branch River (NHRIV700030202-14) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

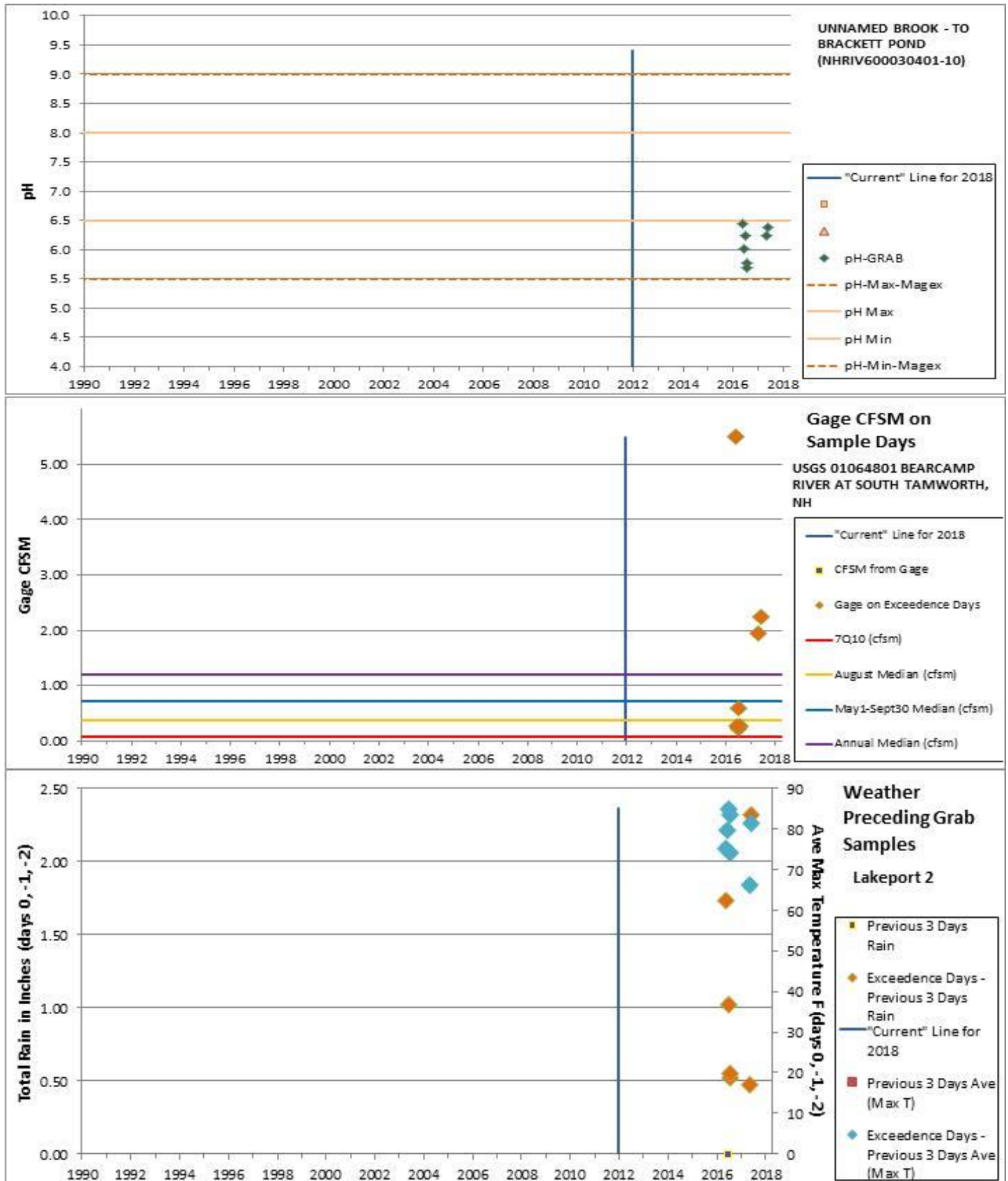
"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

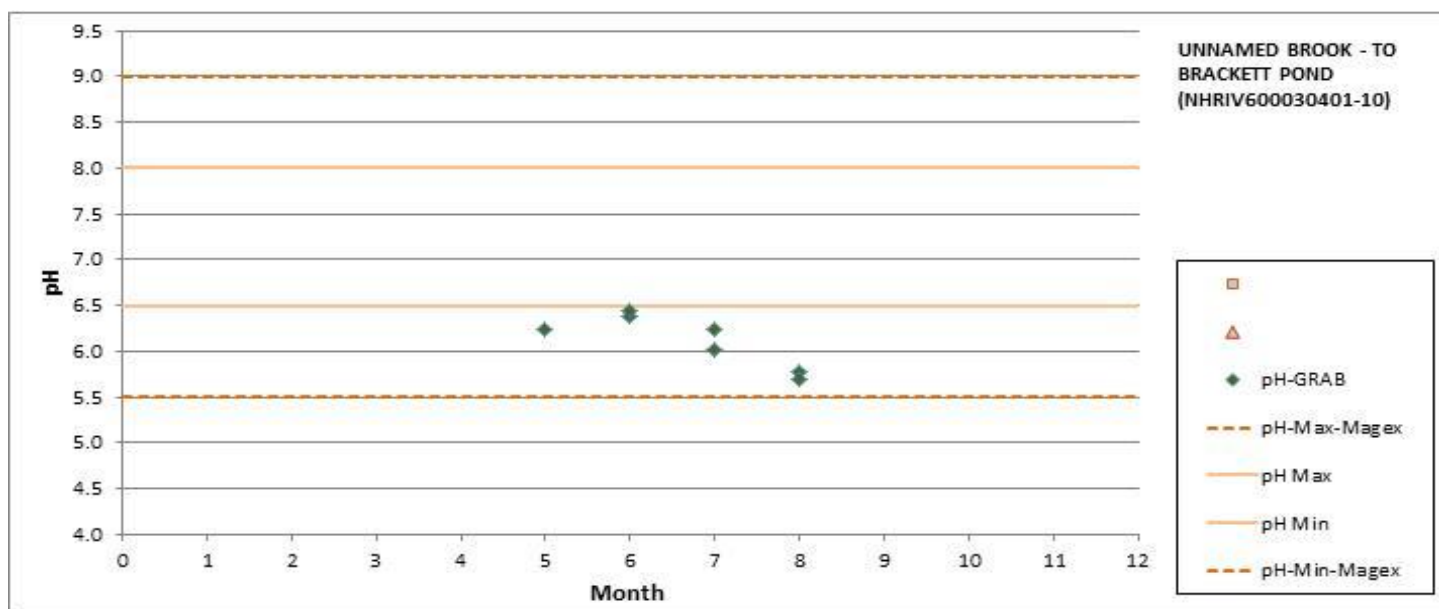
UNNAMED BROOK - TO BRACKETT POND (NHRIV600030401-10)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
UNNAMED BROOK - TO BRACKETT POND	NHRIV600030401-10	pH	WAKEFIELD	3-PNS	5-M

Grab sample data collected in 2016 and 2017 at station LOVWAKB (5.69 – 6.45) triggered the new impairment in the current cycle (2012-2018). All of the grab samples (n= 7) were below the lower water quality criteria (6.5). The low pH samples were collected between May and August at flows ranging from 0.21 to 5.50 cfs on the Bearcamp River gage (01072800) and during varying weather conditions (0.00 – 2.32 inches preceding three-day precipitation). The Unnamed

Brook to Brackett Pond (NHRIV600030401-10) has been moved from 3-PNS to 5-M for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

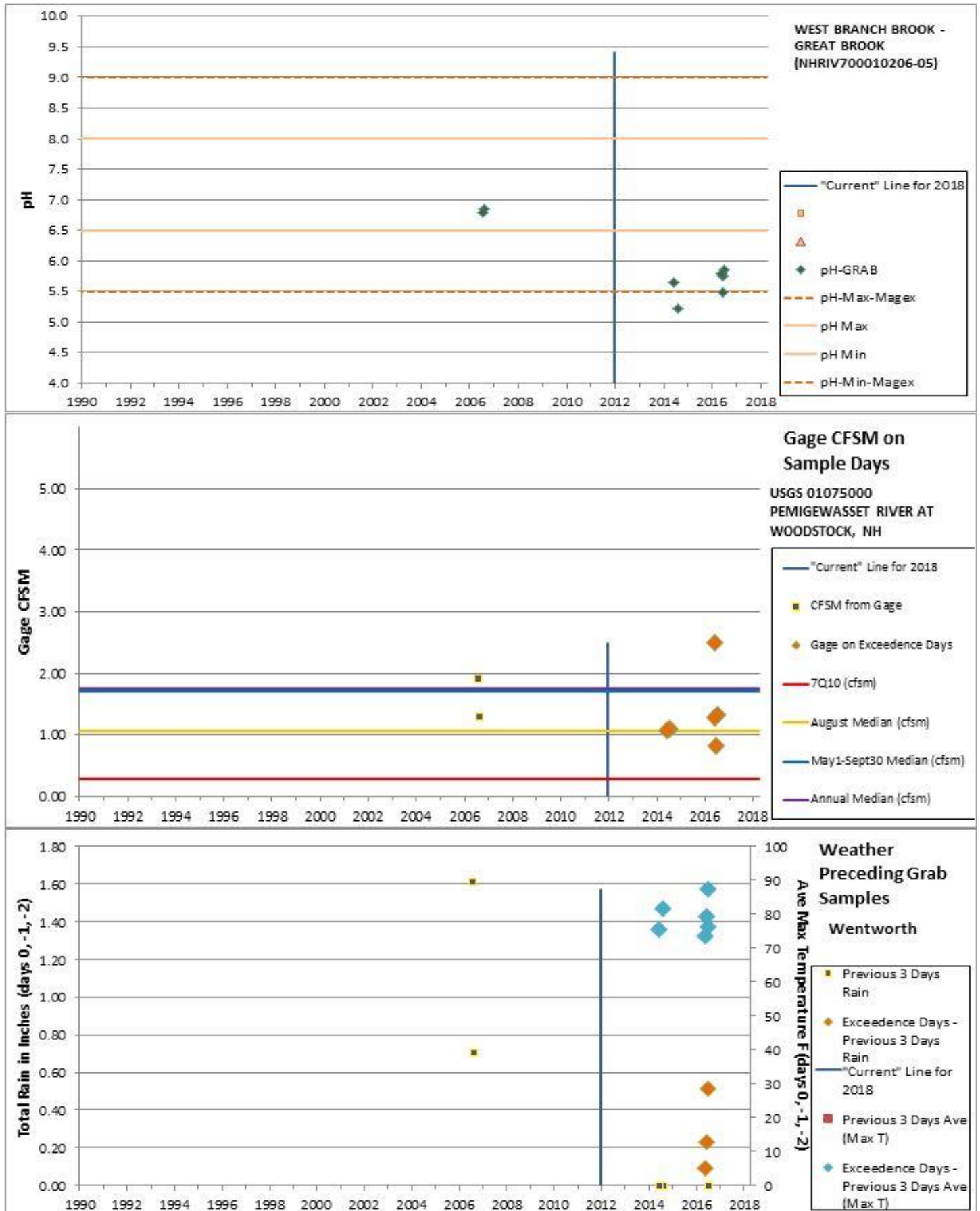
“Magex” refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

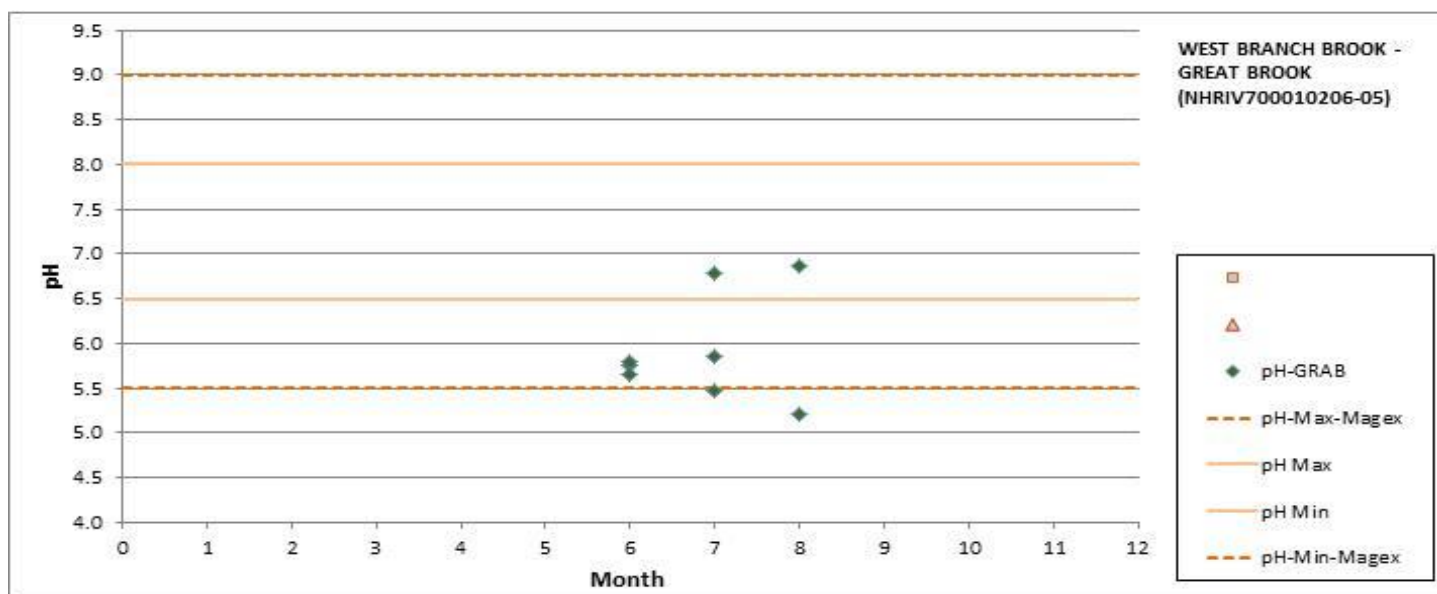
“Current” Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered “current” unless available older data is provided for context. See the 2018 CALM for additional details.

WEST BRANCH BROOK - GREAT BROOK (NHRIV700010206-05)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
WEST BRANCH BROOK - GREAT BROOK	NHRIV700010206-05	pH	CAMPTON, ELLSWORTH, RUMNEY, THORNTON	3-ND	5-P

Grab sample data collected in 2014 and 2016 at station 03-WBB (5.22-5.86) triggered the new impairment in the 2018 cycle. All of the grab samples (n= 6) were below the lower water quality criteria (6.5) with two of the samples below the magex criteria (5.5). The low pH samples were collected between June and August at flows ranging from 0.81 to 2.49 cfs on the Pemigewasset River gage (01075000) and during varying weather conditions (0.00-0.51 inches preceding three-day precipitation). West Branch Brook (NHRIV700010206-05) has been moved from 3-ND to 5-P for pH for the aquatic life integrity designated use based on data collected in the current assessment period.





Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2018 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current" unless available older data is provided for context. See the 2018 CALM for additional details.

Polychlorinated Biphenyls (PCBs) for Fish Consumption

COUNTRY POND (NHLAK700061403-03-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary		
			Town Listed First	2016	2018
COUNTRY POND	NHLAK700061403-03-01	Polychlorinated biphenyls	KINGSTON, NEWTON	n/a	5-M

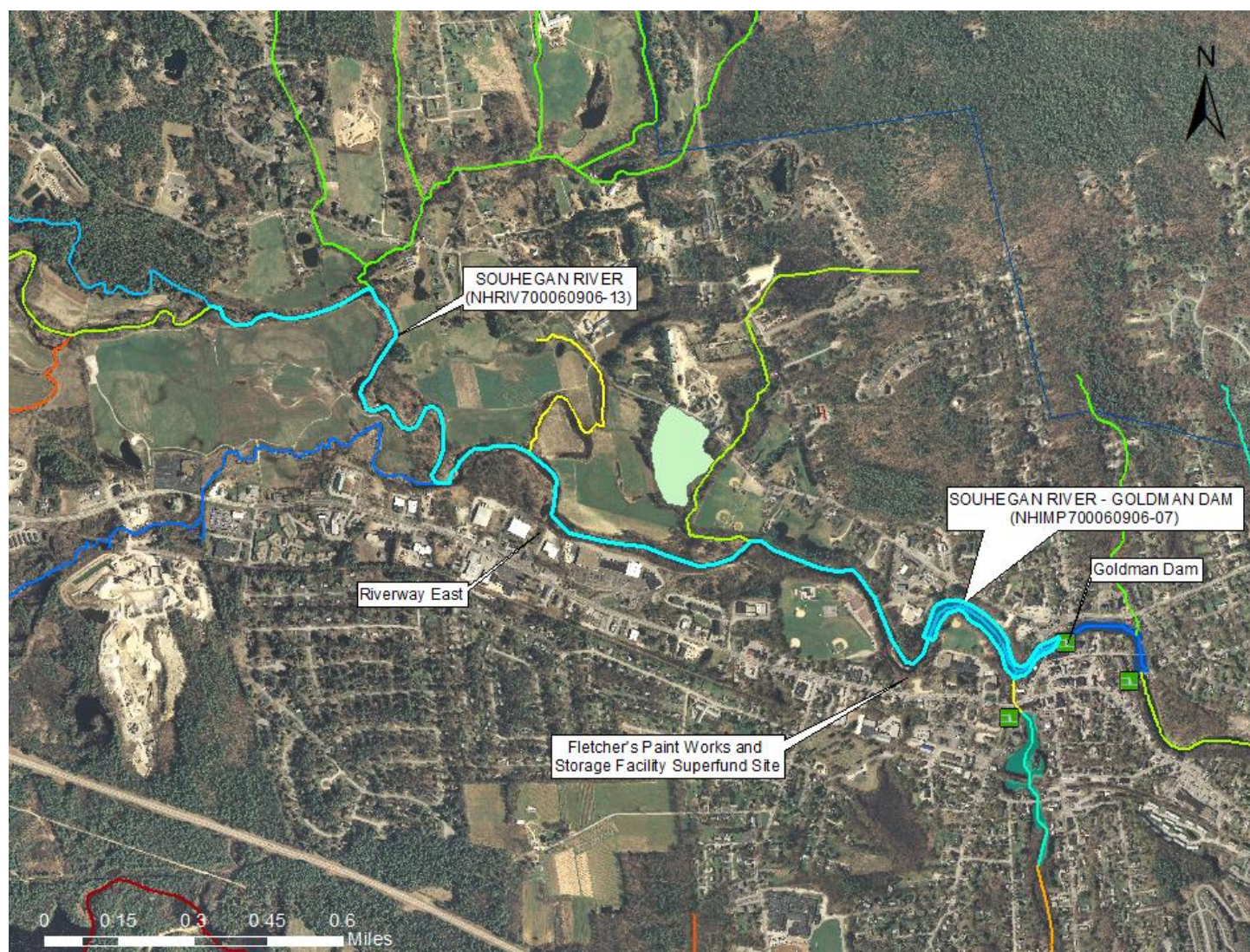
Section 3.2.6 of the 2018 Consolidated Assessment and Listing Methodology (CALM), defines the fish consumption designated use as "Waters that support fish free from contamination at levels that pose a human health risk to consumers." The presence of "restricted consumption" or "no consumption" fish advisories or bans are used to determine if a surface water is not supporting the fish consumption designated use. Fish consumption advisories are issued by the NHDES Environmental Health Program (EHP). According to staff in the EHP, Country Pond (NHLAK700061403-03-01) has a fish consumption advisory due to polychlorinated biphenyls (PCBs). The Ottati & Goss and Great Lakes Container Corporation Superfund Site, located in Kingston, was placed on the National Priorities List (NPL) by the USEPA in 1983 as a result of surface water, groundwater, and sediment contamination from steel drum reconditioning operations conducted from the late 1950s through 1979 and the associated waste handling practices. As part of their ongoing monitoring at the site, the US Environmental Protection Agency (EPA) collected largemouth bass and yellow perch from Country Pond and from Great Pond (as a reference waterbody) in 2009. Samples were analyzed for total PCB congeners. The EHP has evaluated the fish data collected by EPA and determined that a fish consumption advisory was warranted. The EHP added Country Pond to its 2018 "New Hampshire Fish Consumption Guidelines," which is available at

<https://www.des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-ehp-25.pdf>. This document lists all of the NH fish consumption advisories currently in effect. Country Pond (NHLAK700061403-03-01) has been placed in category 5-M for polychlorinated biphenyls for the fish consumption designated use for the 2018 cycle.

SOUHEGAN RIVER (NHRIV700060906-13) & SOUHEGAN RIVER - GOLDMAN DAM (NHIMP700060906-07)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
SOUHEGAN RIVER	NHRIV700060906-13	Polychlorinated biphenyls	MILFORD	n/a	5-M
SOUHEGAN RIVER - GOLDMAN DAM	NHIMP700060906-07	Polychlorinated biphenyls	MILFORD	n/a	5-M

Section 3.2.6 of the 2018 Consolidated Assessment and Listing Methodology (CALM) defines the fish consumption designated use as “Waters that support fish free from contamination at levels that pose a human health risk to consumers.” The presence of “restricted consumption” or “no consumption” fish advisories or bans are used to determine if a surface water is not supporting the fish consumption designated use. Fish consumption advisories are issued by the NHDES Environmental Health Program (EHP). According to staff in the EHP, the Souhegan River between Riverway East and the Goldman Dam has a fish consumption advisory due to polychlorinated biphenyls (PCBs). The portion of the Souhegan River between Riverway East and the Goldman Dam spans two assessment units: NHRIV700060906-13 and NHIMP700060906-07. This portion of the Souhegan River is in the vicinity of the Fletcher’s Paint Works and Storage Facility Superfund Site, in the Town of Milford. Fletcher’s Paint Works was in operation from 1948 until 1991 as a manufacturer and retail distributor of paints and stains. The Site was officially listed on the National Priorities List (NPL) by the USEPA on March 31, 1989, as a result of investigations related to the 1984 closure of the Keyes Municipal Water Supply Well (Keyes Well), which serviced a nearby population in Milford. Contamination at the site was the result of 20 years of storage and release of scrap pyranol, which is a mixture of PCBs and solvents. Drummed wastes containing VOCs, base/neutral solids and liquids, and PCB liquids, were stored on site from the mid-1950s through the late 1980s. The USEPA conducted a risk assessment of sediments from the Souhegan River in 2011. The conclusion of the risk assessment was that there is an elevated risk to human health from the ingestion of PCB contaminated fish and from exposure to PCB-contaminated sediments located near the Elm Street portion of the site. Details can be found in the Final Supplemental Baseline Human Health and Ecological Risk Assessment conducted by Battelle in 2011, which is available at www.epa.gov/superfund/fletcher. The EHP added the Souhegan River between Riverway East and the Goldman Dam to its 2018 “New Hampshire Fish Consumption Guidelines,” which is available at <https://www.des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-ehp-25.pdf>. This document lists all of the NH fish consumption advisories currently in effect. The Souhegan River (NHRIV700060906-13) and the Souhegan River - Goldman Dam (NHIMP700060906-07) have been placed in category 5-M for polychlorinated biphenyls for the fish consumption designated use for the 2018 cycle.

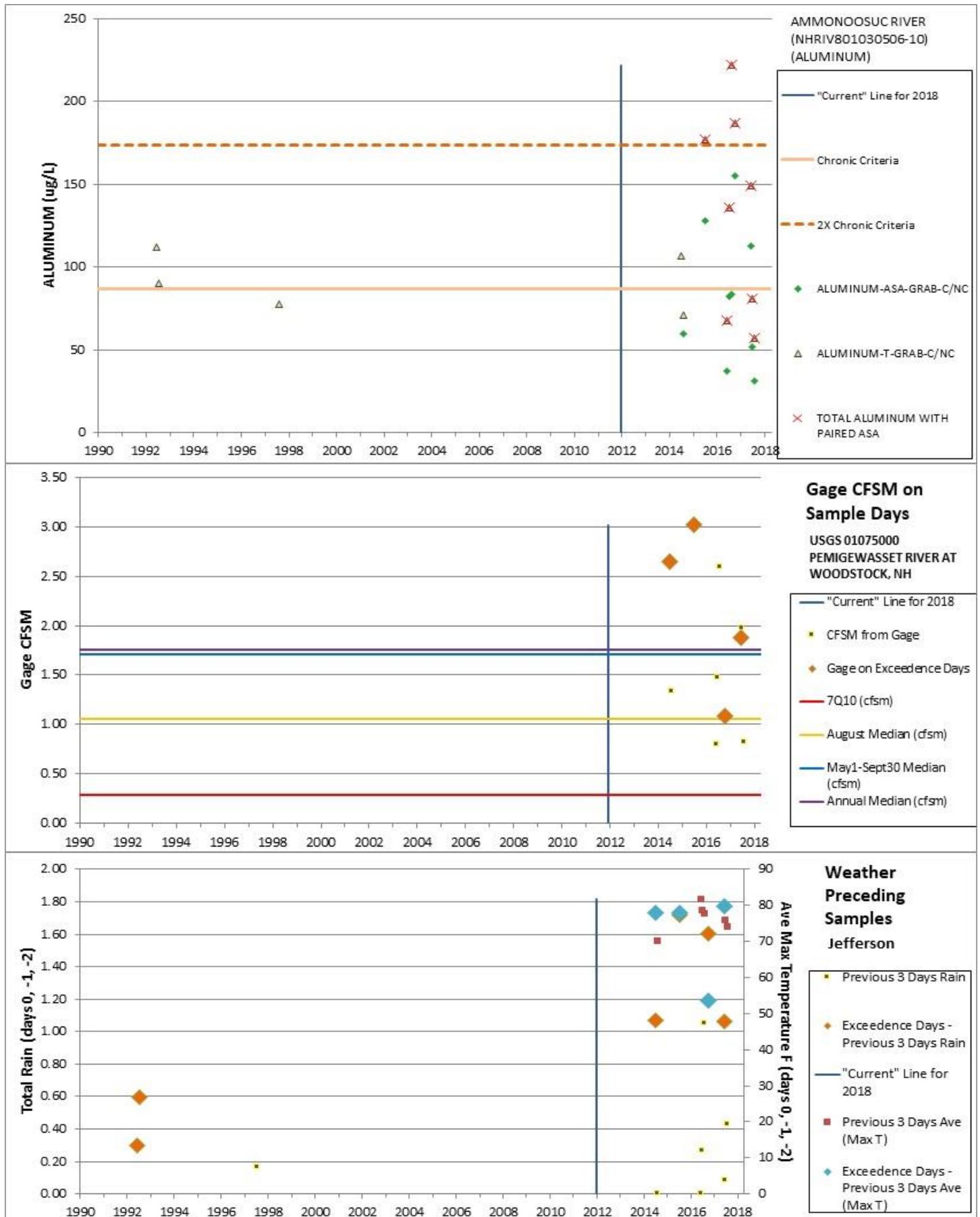


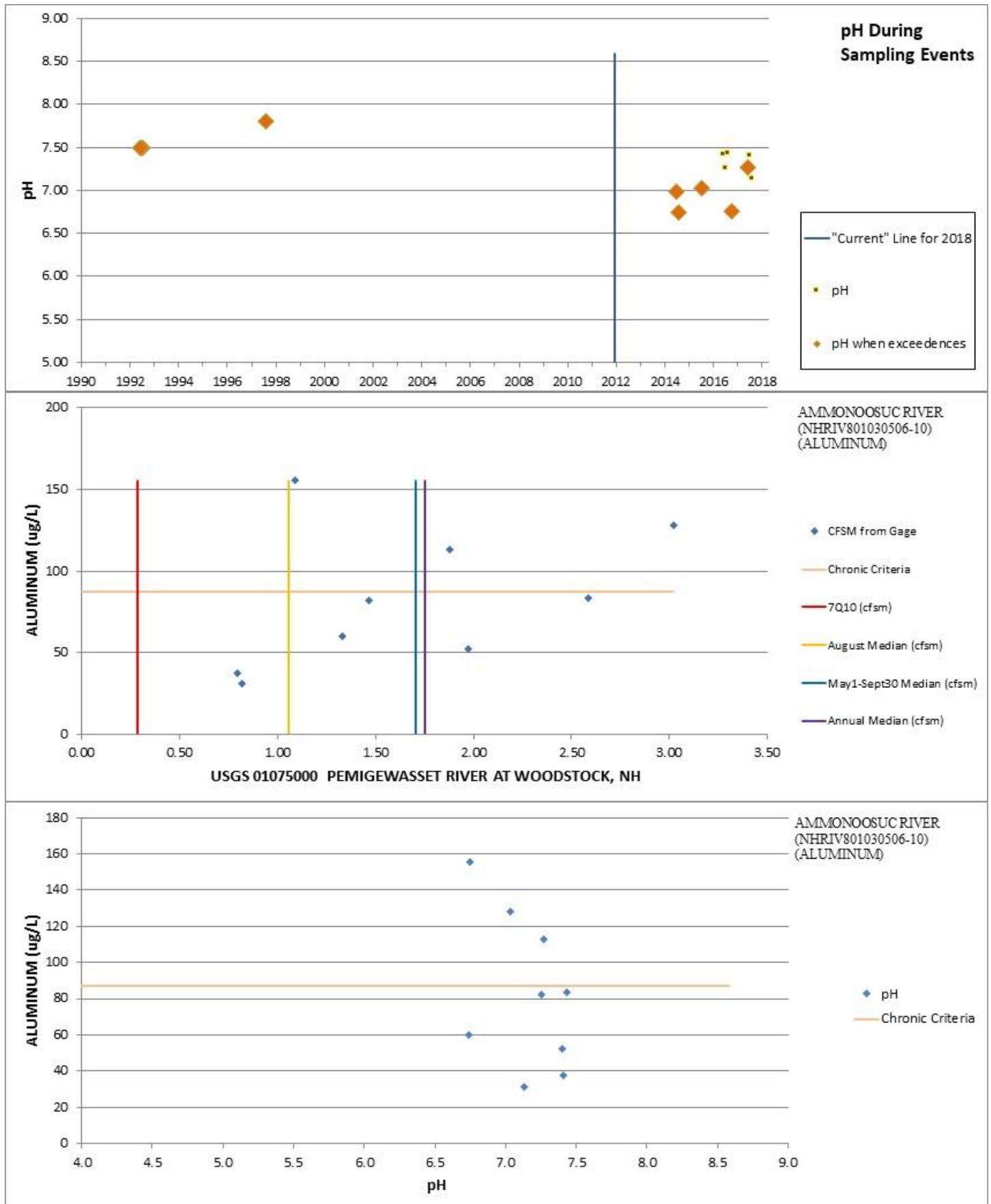
Toxics for Aquatic Life Integrity

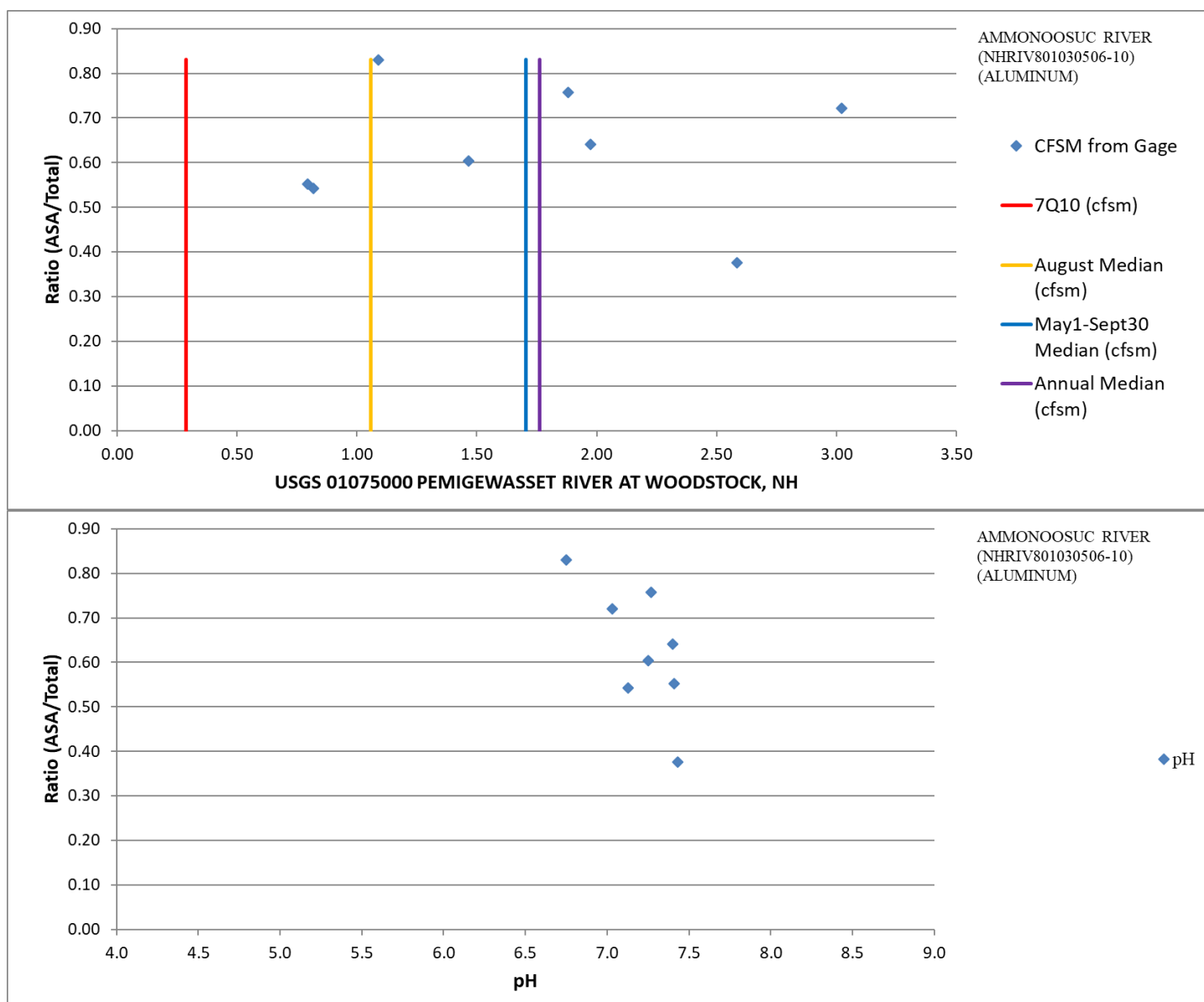
AMMONOOSUC RIVER (NHRIV801030506-10)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
AMMONOOSUC RIVER	NHRIV801030506-10	Aluminum	BATH	3-PNS	5-M

Three of the nine (33%) acid-soluble aluminum samples collected during the current assessment period (2012 to 2018), at stations 03-AMM, were above the chronic criteria (87 ug/L) resulting in a new impairment for this assessment unit during the 2018 cycle. The high acid-soluble aluminum samples, which were collected in 2015, 2016 and 2017, had 3-day rainfall totals greater than one inch and with flows ranging from 1.09 – 3.02 cfs at the Pemigewasset River gage (01075000) in June, July and October. The Ammonoosuc River (NHRIV801030506-10) has been moved from 3-PNS to 5-M for aluminum for the aquatic life integrity designated use based on data collected in the current assessment period.



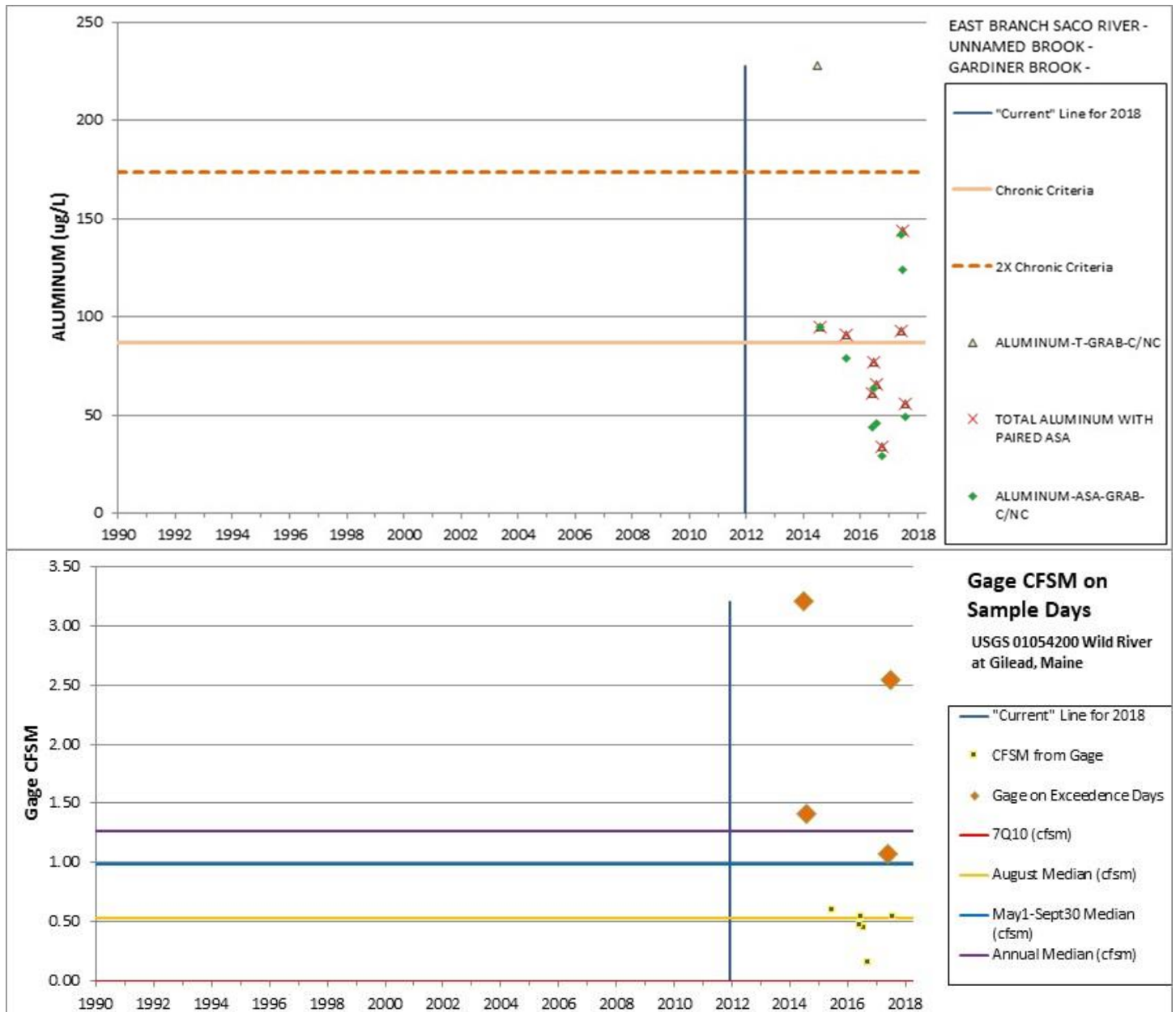


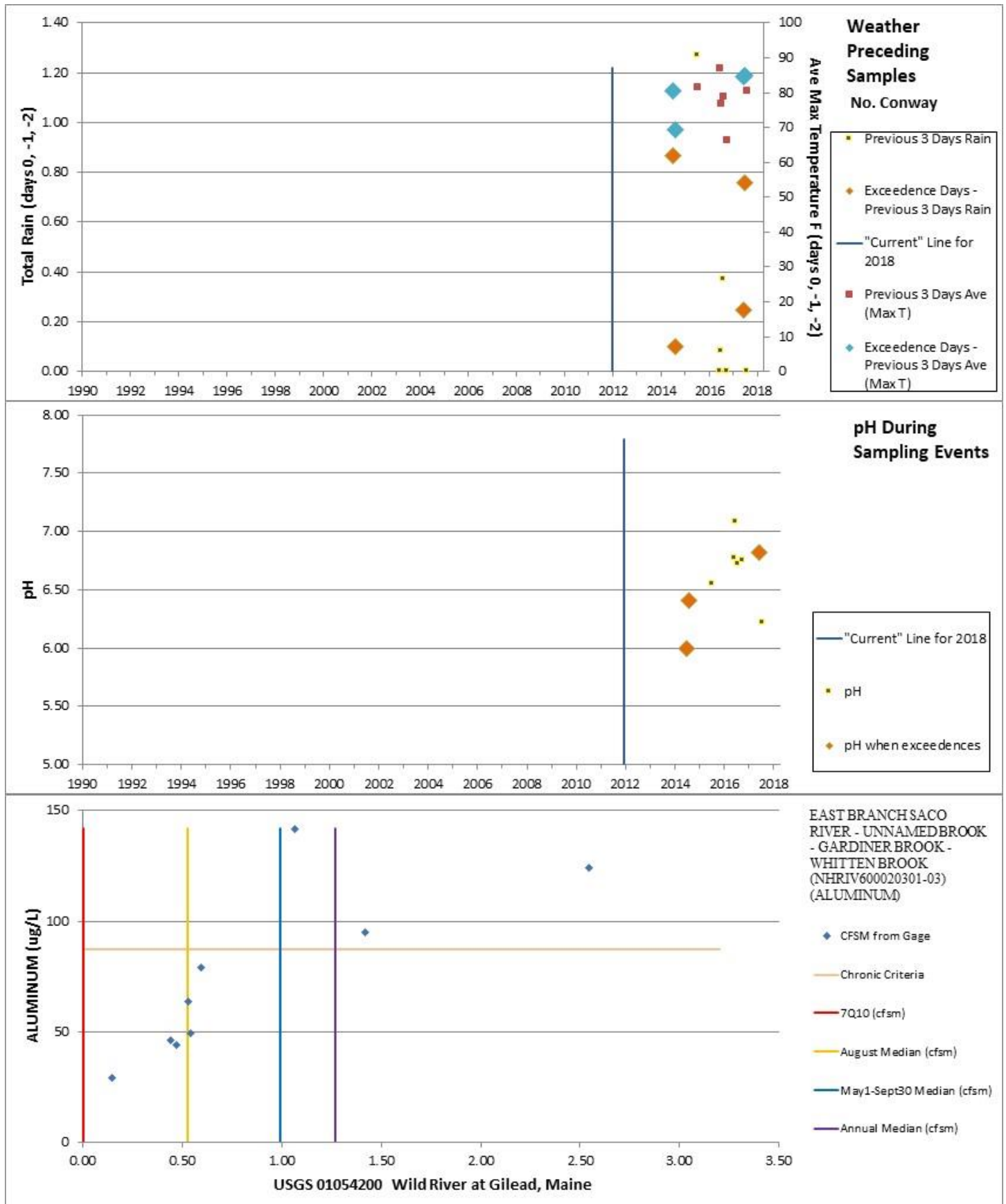


EAST BRANCH SACO RIVER - UNNAMED BROOK - GARDINER BROOK - WHITTEN BROOK (NHRIV600020301-03)

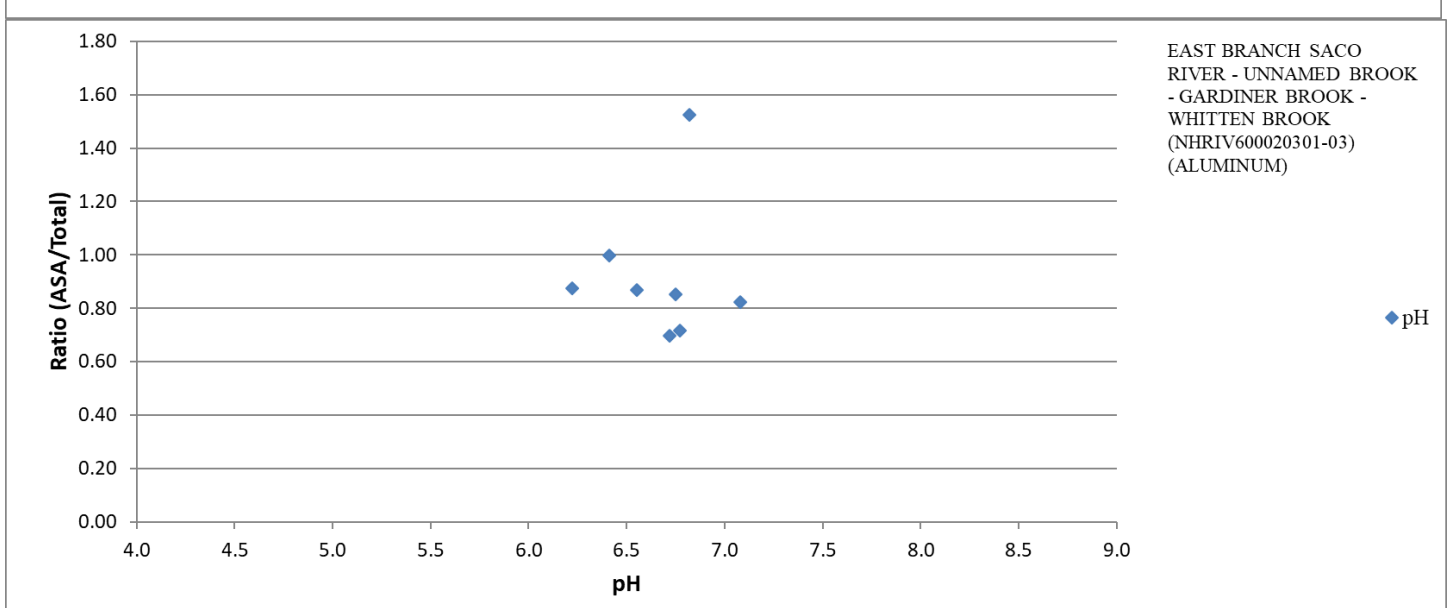
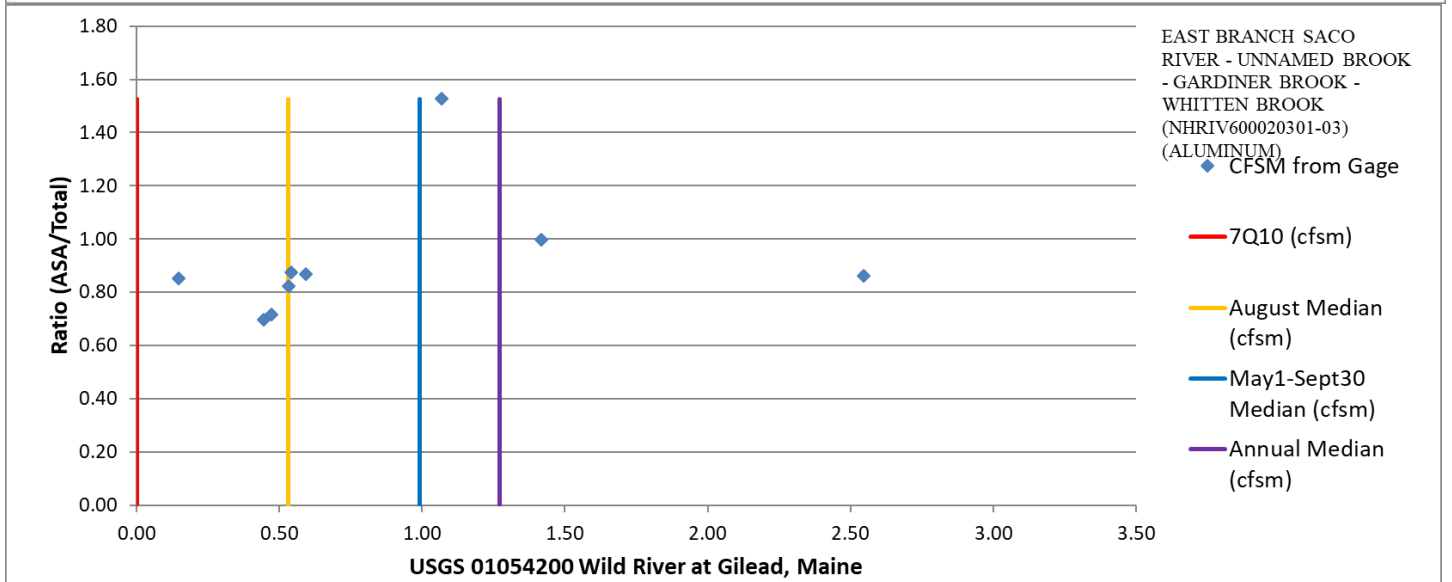
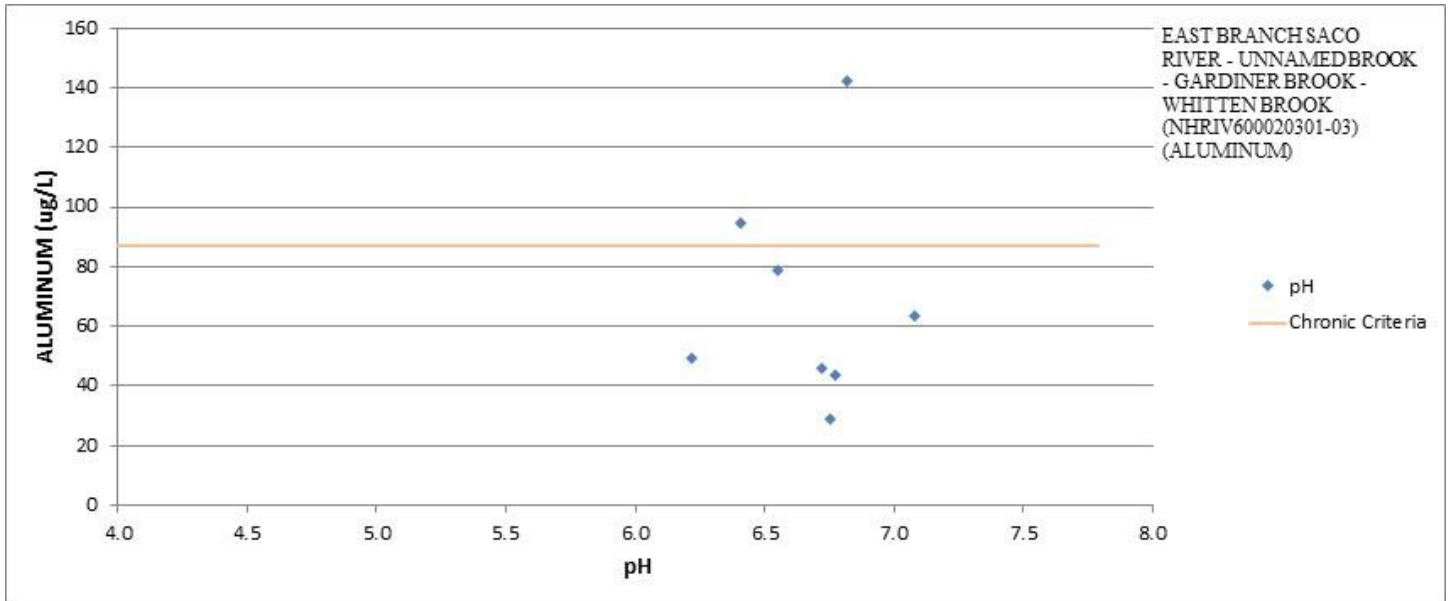
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
EAST BRANCH SACO RIVER - UNNAMED BROOK - GARDINER BROOK - WHITTEN BROOK	NHRIV600020301-03	Aluminum	BARTLETT, CHATHAM	3-PNS	5-M

Three of the nine (33%) acid-soluble aluminum samples collected during the current assessment period (2012 to 2018), at stations 06-EBS, were above the chronic criteria (87 ug/L) resulting in a new impairment for this assessment unit during the 2018 cycle. The high acid-soluble aluminum samples, which were collected in 2014 and 2017, had 3-day rainfall totals below 0.80 inches and with flows ranging from 1.07 - 2.55 cfs at the Wild River gage (01054200) in June, July and August. The East Branch Saco River (NHRIV600020301-03) has been moved from 3-PNS to 5-M for aluminum for the aquatic life integrity designated use based on data collected in the current assessment period.





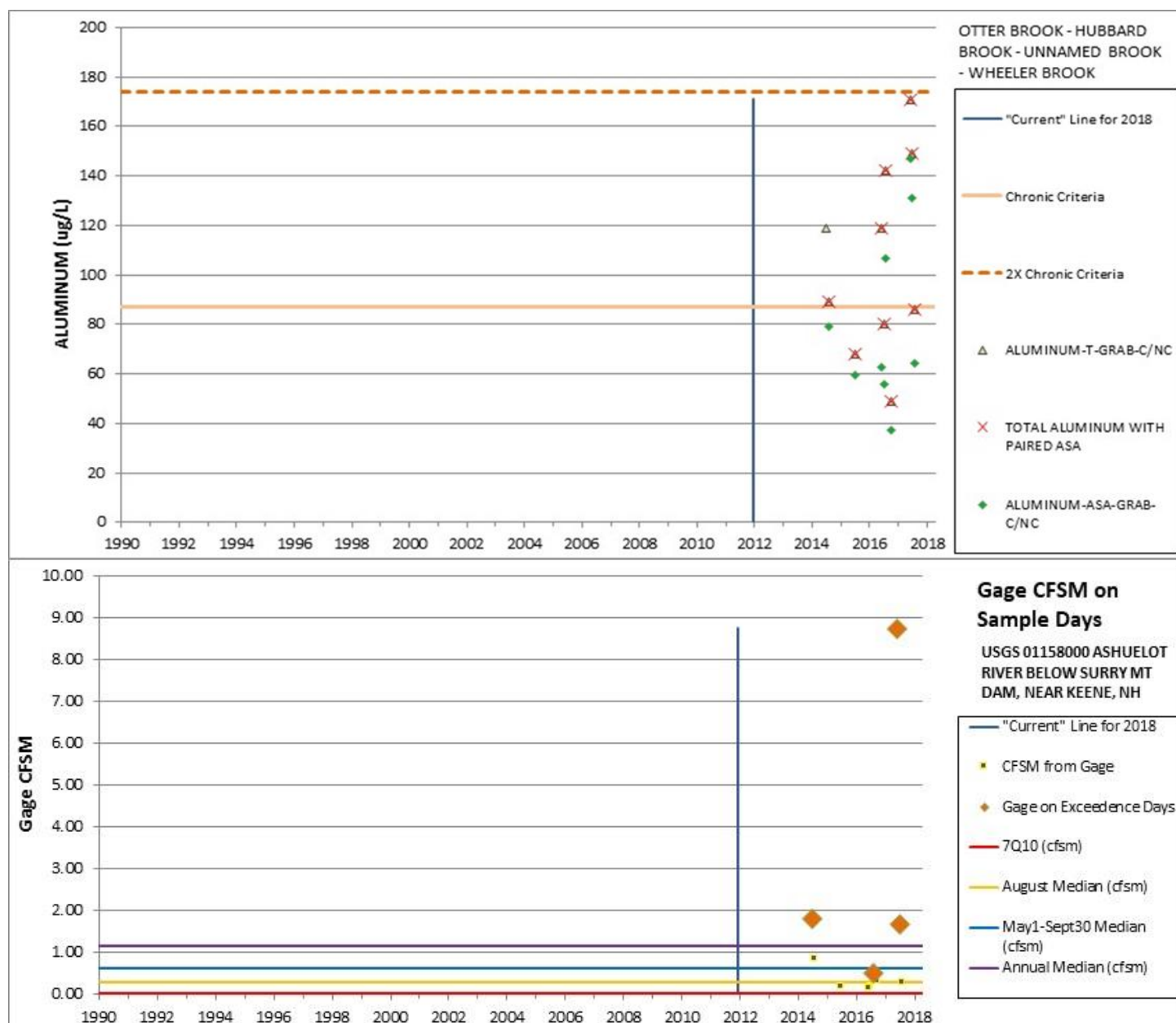
Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters

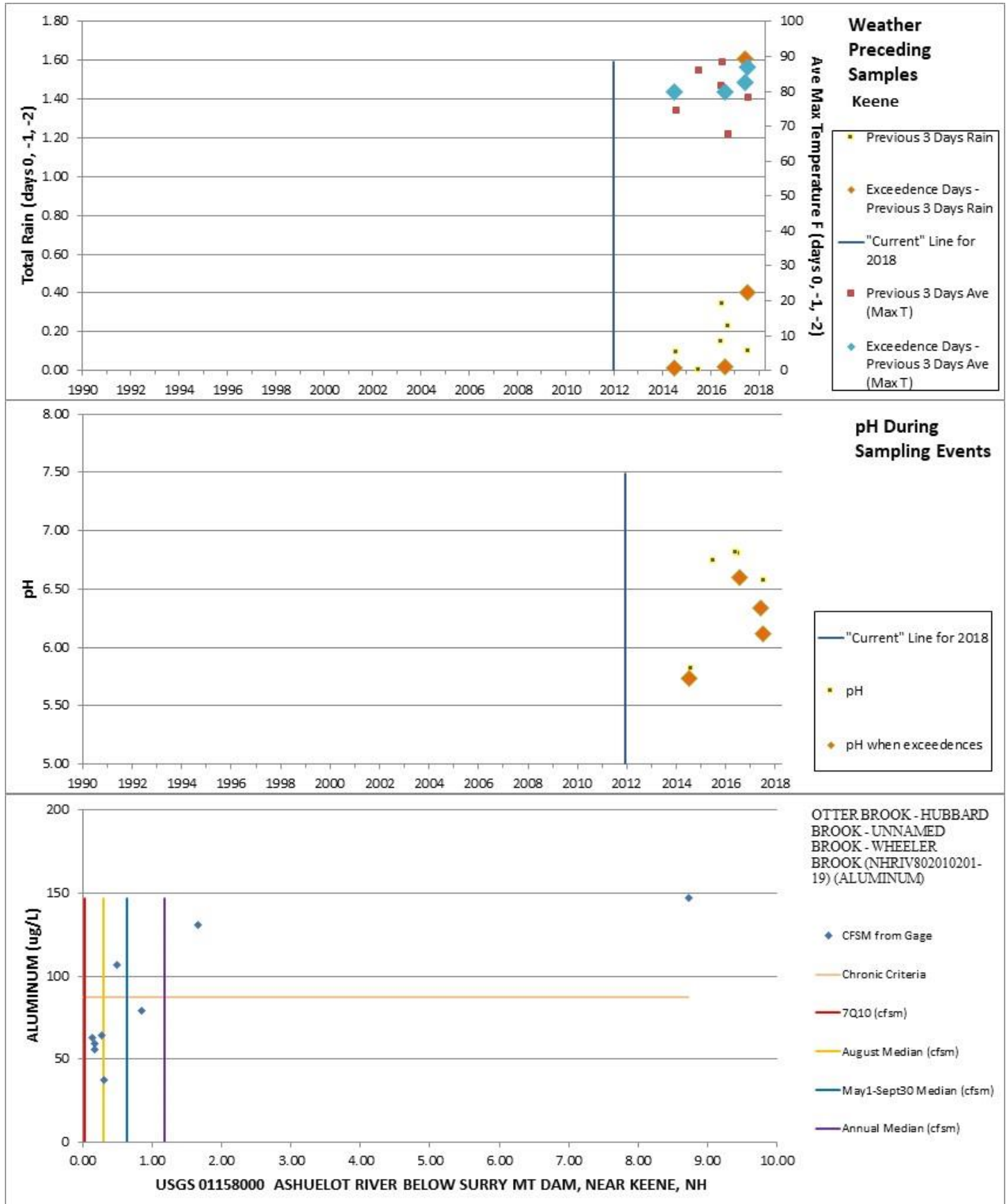


OTTER BROOK - HUBBARD BROOK - UNNAMED BROOK - WHEELER BROOK **(NHRIV802010201-19)**

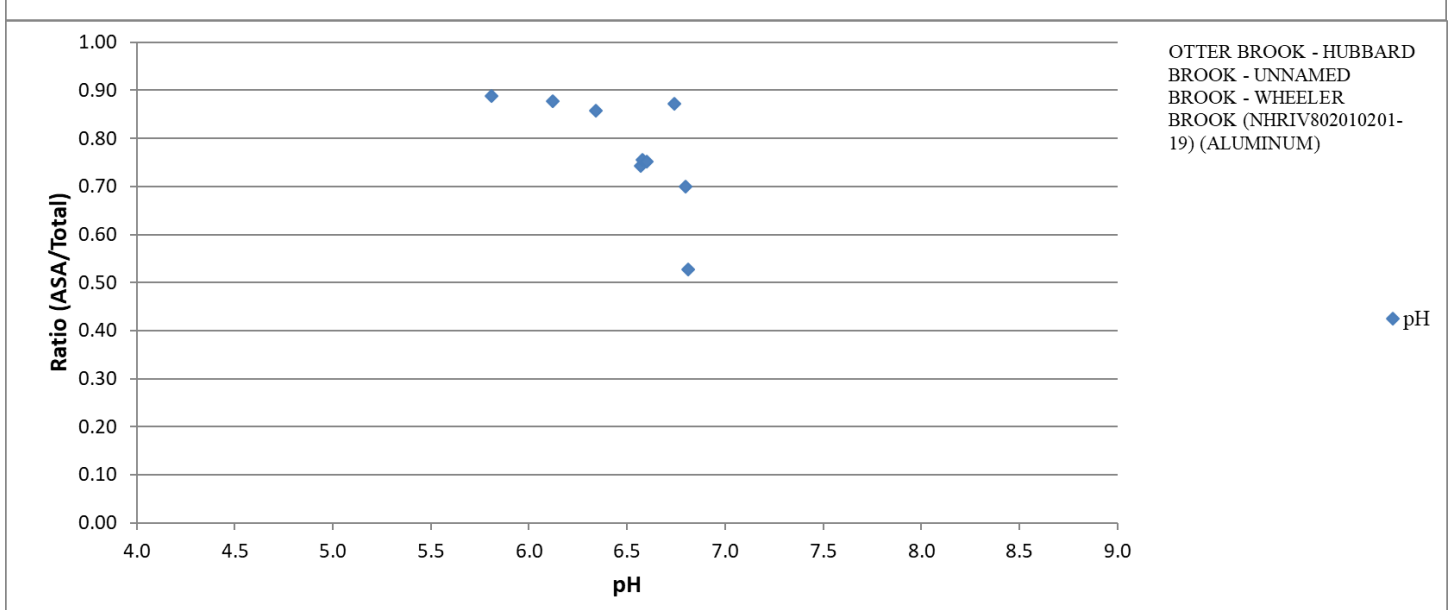
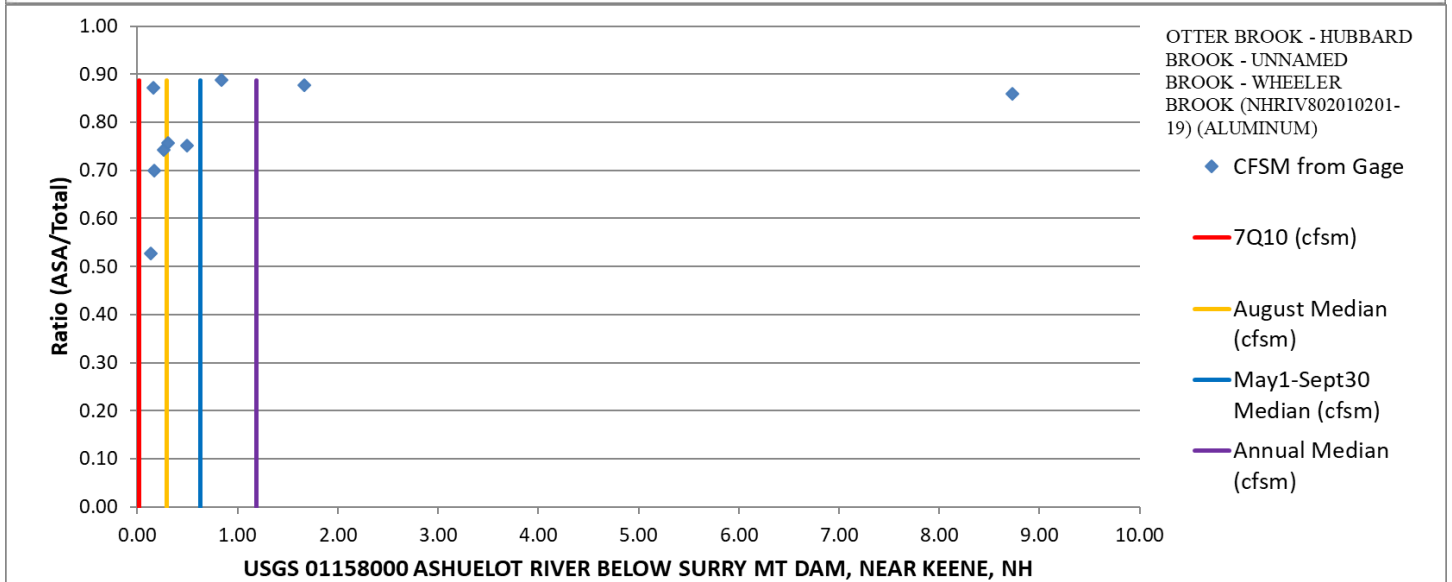
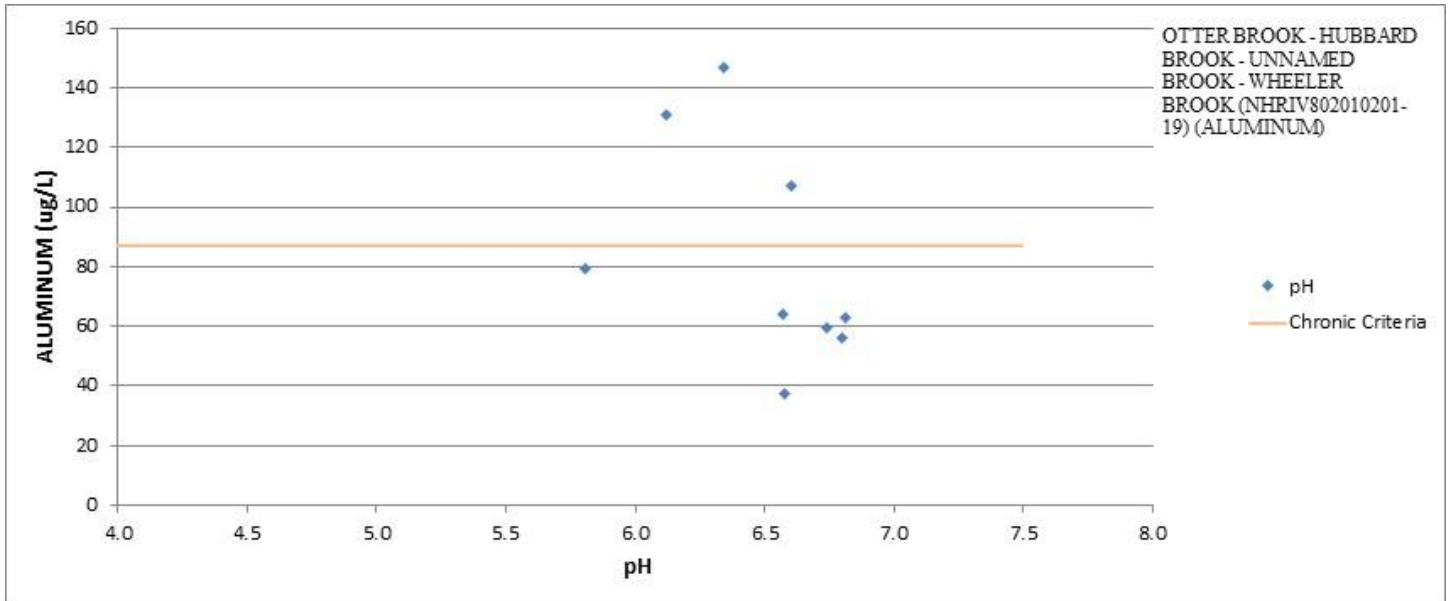
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
OTTER BROOK - HUBBARD BROOK - UNNAMED BROOK - WHEELER BROOK	NHRIV802010201-19	Aluminum	SULLIVAN, KEENE, NELSON, ROXBURY	3-PAS	5-M

Three of the nine (33%) acid-soluble aluminum samples collected during the current assessment period (2012 to 2018), at stations 01X-OTB, were above the chronic criteria (87 ug/L) resulting in a new impairment for this assessment unit during the 2018 cycle. The high acid-soluble aluminum samples, which were collected in 2016 and 2017, had 3-day rainfall totals ranging from less than a half inch all the way to over 1.5 inches. Similarly, flows ranged from 0.49 – 8.73 cfs at the Ashuelot River gage (01158000) in June, July and August. Otter Brook (NHRIV802010201-19) has been moved from 3-PAS to 5-M for aluminum for the aquatic life integrity designated use based on data collected in the current assessment period.





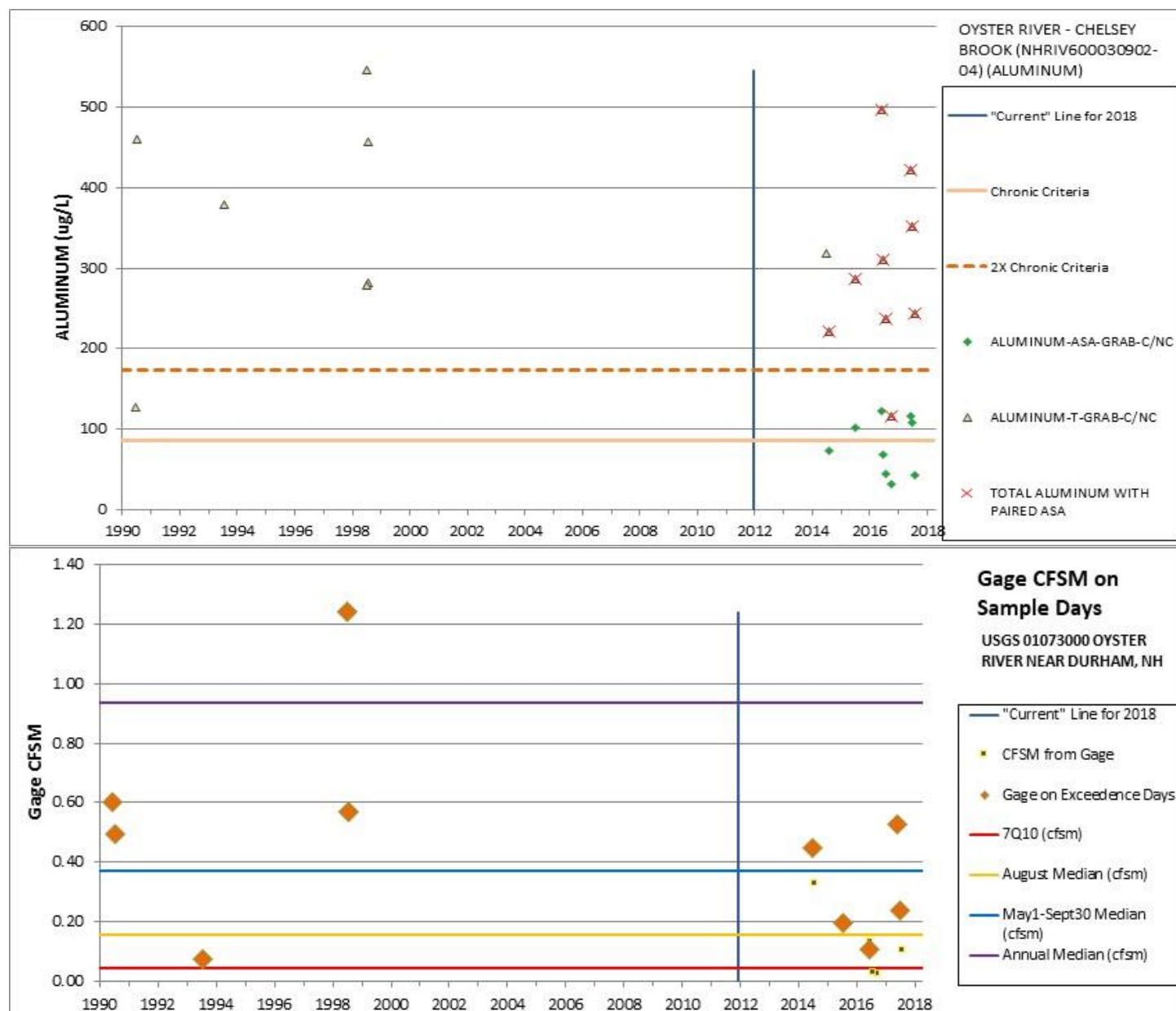
Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters

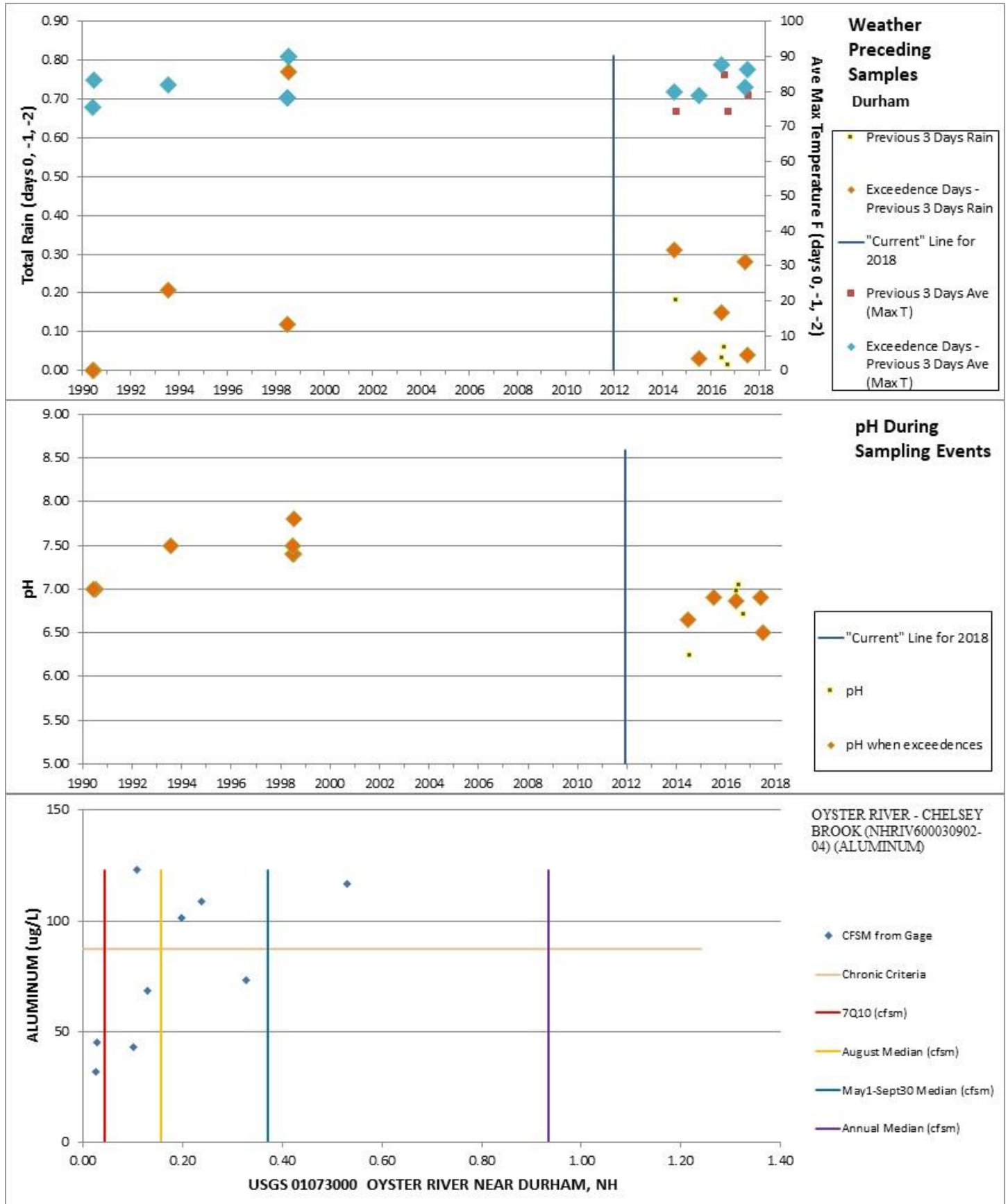


OYSTER RIVER - CHELSEY BROOK (NHRIV600030902-04)

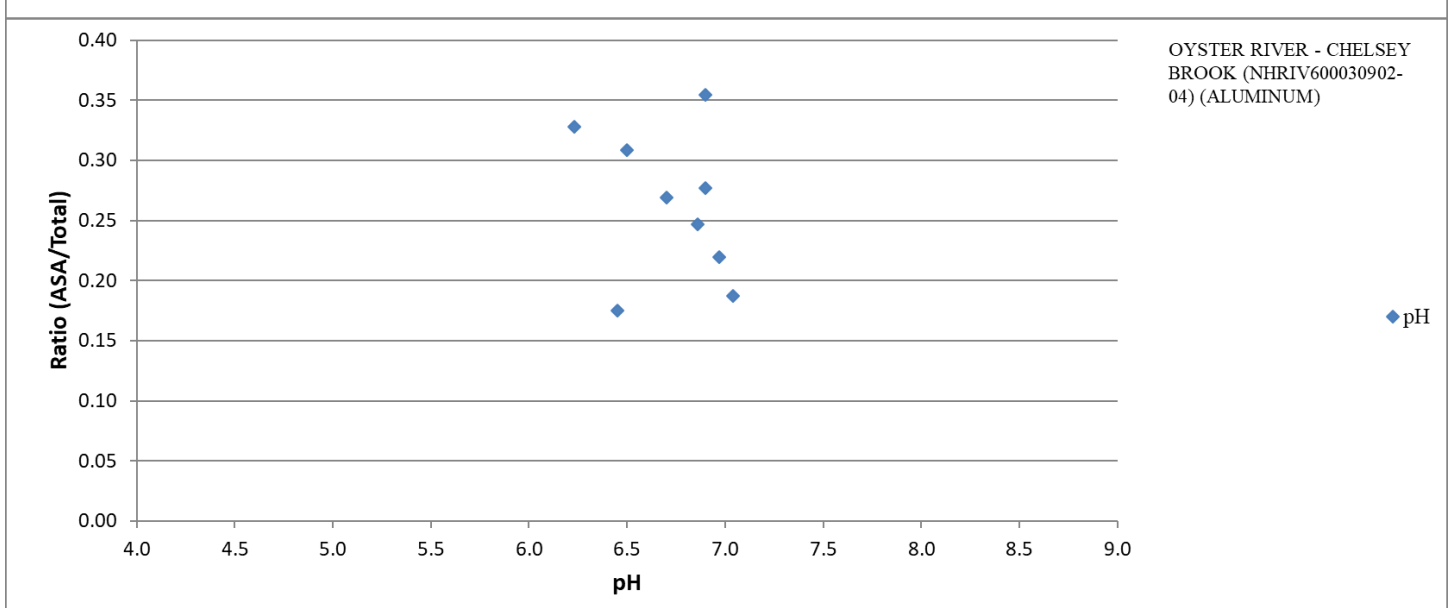
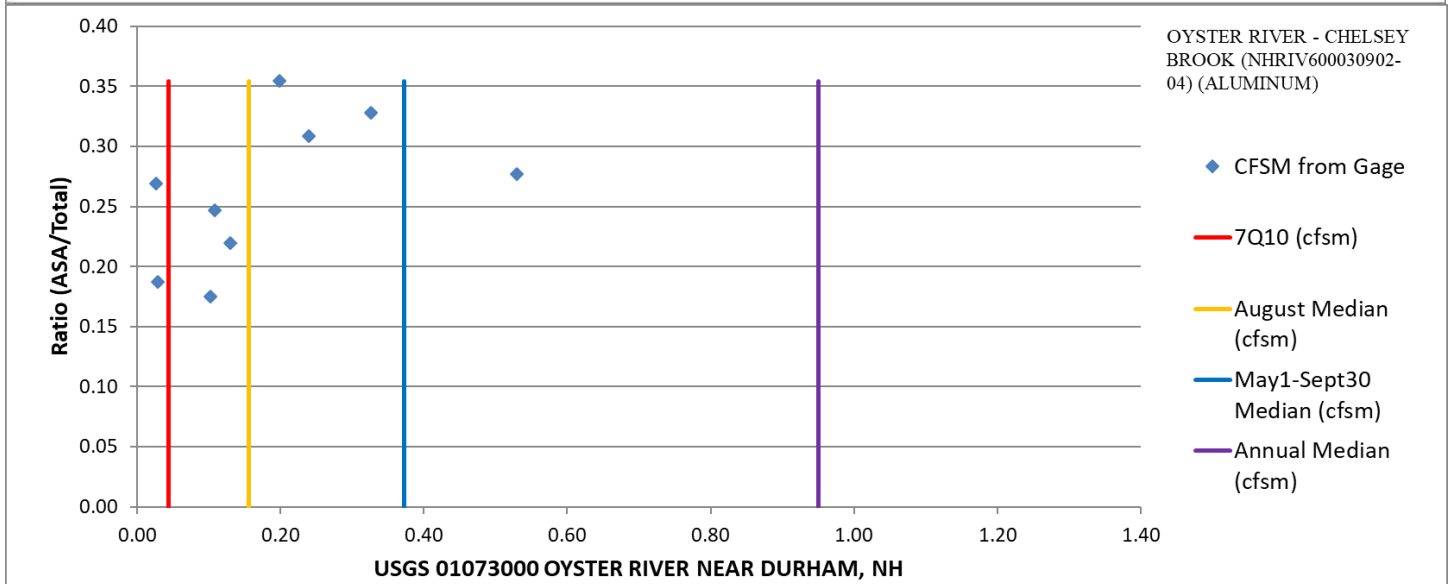
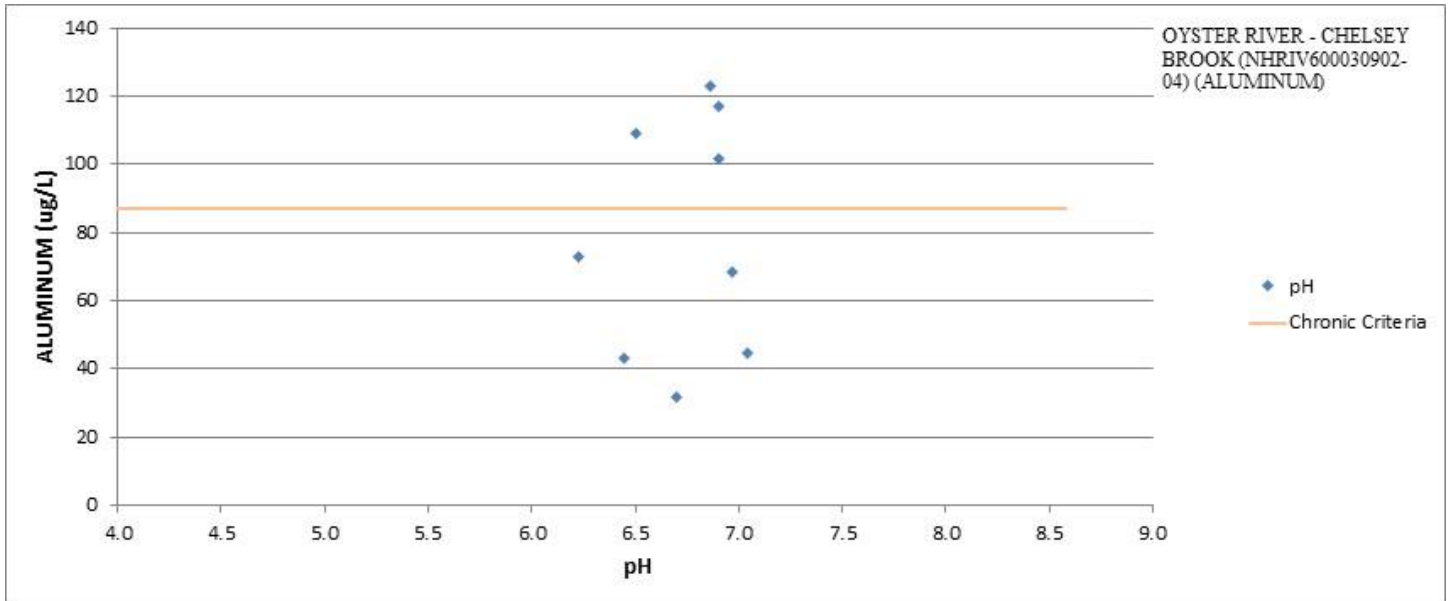
Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
OYSTER RIVER - CHELSEY BROOK	NHRIV600030902-04	Aluminum	LEE, DURHAM, MADBURY	3-PNS	5-M

Four of the nine (44%) acid-soluble aluminum samples collected during the current assessment period (2012 to 2018), at stations 09-OYS, were above the chronic criteria (87 ug/L) resulting in a new impairment for this assessment unit during the 2018 cycle. The high acid-soluble aluminum samples, which were collected in 2015, 2016 and 2017, had 3-day rainfall totals below 0.30 inches and with flows ranging from 0.11 - 0.53 cfs at the Oyster River gage (01073000) in June and July. The Oyster River (NHRIV600030902-04) has been moved from 3-PNS to 5-M for aluminum for the aquatic life integrity designated use based on data collected in the current assessment period.





Impairments Added to the 2018 303(d) Lists of Threatened or Impaired Waters



Water Clarity (Light Attenuation Coefficient) for Aquatic Life Integrity

SQUAMSCOTT RIVER NORTH (NHEST600030806-01-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Town(s) - Primary Town Listed First	2016	2018
SQUAMSCOTT RIVER NORTH	NHEST600030806-01-02	Light Attenuation Coefficient	STRATHAM, NEWFIELDS	3-PNS	5-P

On October 14, 2015, the New Hampshire Department of Environmental Services (NHDES) released the Draft 2014 303(d) List of impaired waters for public comment. Public comments were accepted through the close of business on December 11, 2015. In response to the public comments received, NHDES reverted the draft 2014 Light Attenuation Coefficient for the Aquatic Life Integrity designated use for the Squamscott River North (NHEST600030806-01-02) from category 3-PNS to 5-P. Although the change was incorporated into the final Technical Support Document for the Great Bay Estuary, it was not changed in NHDES' Supplemental Assessment Database (SADB). The SADB was subsequently queried to build an Excel version of NHDES' Final 303(d) list, which was submitted with a collection of 303(d) related documents to EPA on March 27, 2017, and received partial approval on March 16, 2018. In their partial approval EPA's intent was that the Squamscott River North (NHEST600030806-01-02) was impaired due to poor light attenuation in recognition that all of the supporting documents submitted by NHDES indicated that the Squamscott River North was impaired.

- Impairments Added to the 2014 305(b)/303(d) document (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-16.pdf>),
- Waters Removed Since the 2012 Section 303(d) List summary document (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-14.pdf>),
- Response to Comments on the Draft Section 303(d) List of Threatened or Impaired Waters (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-17-01.pdf>), and
- Technical Support Document for the Great Bay Estuary Aquatic Life Use Support Assessments, 2014 305(b) Report/303(d) List (<https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2014/documents/r-wd-15-12.pdf>).

As the EPA has not fully approved the 2014 303(d), the full database has not yet been submitted to EPA. This incorrect assessment category in the SADB was carried through the 2016 cycle and not discovered by NHDES until the 2018 assessments. In order to correct this SADB error, the Squamscott River North (NHEST600030806-01-02) assessment unit has been reset to 5-P in the SADB for Light Attenuation Coefficient for the aquatic life integrity designated use for the 2018 cycle. A full description of the rationale used to make the assessment determination for this waterbody is provided in the Technical Support Document for the Great Bay Estuary Aquatic Life Integrity Use Support Assessments, 2018 305(b) Report/303(d) List (<http://des.nh.gov/organization/divisions/water/wmb/swqa/2018/index.htm>).